ving
ire

Licory of Potash
1/4 of an Ounce and
1 Pint of Best Gin

One Spoon full twice
a Day.

Receipt

Receipt

Steal not this book,
For fear of shame,
For here you see,
The owner's name.
Lest God should ask

At the last day
Where is that book
You stole away.

John Collins

1105

# FOURTH BOOK

OF

# LESSONS

FOR THE

# USE OF SCHOOLS.

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# PREFACE.

THE FOURTH BOOK OF LESSONS having been compiled on the same principles as the First, Second, and Third Teachers are recommended to pursue the same methods in using it.—Their Pupils should be made to spell, without the book, all the difficult words in every Lesson: and, though it is expected that Grammar and Geography be now taught from text-books, yet Teachers should continue to put occasional questions on both these branches of education, in the course of the ordinary examinations. Any sentence can be made an exercise in Grammar; and there is a whole Section of Lessons devoted to subjects connected with Geography, which ought to be exp'ained from Maps The Section of Lessons on Scripture History will aid Teachers in communicating to their Pupils an accurate knowledge of the historical parts of the Bible. When an object described in any Lesson, or a plate or drawing of it, can be procured, the object itself or the drawing, ought to be shown to the Pupils, and the Teacher should require them to explain, not only what is said of it in the text book, but all its distinguishing properties, as well as those which it has in common with other objects of the same kind. After having been examined on a Lesson, they should also be made to state, in their own words, all that they have learned from it Masters will derive considerable assistance in teaching, and Pupils in learning the Lessons, from the list of Latin and Greek roots in the Appendix. Those in the First Section have been arranged according to the Lessons in which they first occur, and have been selected at the rate of six roots to each page of reading. It will be of advantage, therefore, to teach the First Section by prescribing for each Lesson, a page to be spelled, read, and explained, and six roots to be committed to memory. In hearing the Latin and Greek roots, Teachers will be careful to examine their Pupils on the formation of English words from them, by joining prefixes, affixes, and other words: and they will also cause them to give, in addition to the examples in the book, as many English words formed from the same root as they can recollect. The object of this exercise is to accustom young persons to habits of combination and analysis, as well as to give them a command of expressions in their own language. When the Teacher is examining on the Reading Lesson, he will make his Pupils point out all the words of which he has learned the Latin and Greek roots, explain them according to their derivation, and show how they are formed. To enable them to do this more easily, the English derivatives from the Latin and Greek Roots in each Lesson of the First Section have been printed in Italics in the corresponding Reading Lesson. Each Lesson of Roots does not contain all that are to be found in the Reading Lesson: but the First Section of Roots contains all that occur in the First Section of Reading Lessons. It is recommended, therefore, that when the whole of that Section has been learned, at the rate of a page of reading and six roots for each lesson, it should be carefully revised, when the pupils should be able to explain every derivative word which occurs. Having done this, they will proceed to the Second Section of Reading Lessons, and also to the Second Section ot Latin and Greek Roots, which containing only those additional primitives which did not occur in the First Section, has not been arranged in Lessons. Teachers will use their own discretion as to the number to be prescribed for a lesson; but they will take care to make their pupils continue to apply all the roots in the First Section. They will proceed in the same way with the Third, Fourth, and Fifth Sections.—Some of these directions will be made more intelligible by the subjoined example of the method in which the lessons are recommended to be taught:—

> "Linnæus, the great Swedish naturalist, characterizes and divides the three kingdoms of nature, the animal, the vegetable, and the mineral, in the following manner: 'stones *grow;* vegetables grow and *live;* animals grow, live, and *feel.*

The teacher having seen that his pupils can spell every word in this sentence, and read it with proper pronunciation, accent and emphasis may examine them upon it as follows:—Who was Linnæus?—A Swedish naturalist. From what Latin root is *naturalist* formed?—*Natura*, nature. What is the first affix added to *natura?—Al*, of or belonging to. What part of speech is *natural?*—An adjective. What affix is then added to *natural?—Ist*, a doer. What part of speech is *naturalist?*—A noun. Why is it called a noun?—Because it is applied to a person. Applied to persons what should it be?—*Naturalists*, in the plural number. Is it applied to males or females?—To both, and is therefore of the common gender. What is the meaning of the word *naturalist?*—A person who studies nature. What kind of a naturalist was Linnæus? — Great. What part of speech is *great?* — An adjective, because it expresses quality. Where was Linnæus born?—In Sweden. Where is Sweden?—In the north of Europe. Point it out on the map. What is Linnæus said to have done?—He characterized and divided, &c. What parts of speech are these words?—Active verbs, because they express what Linnæus did. Any affix in *characterize?—Ize*, to make. The meaning of the word?—To make or give a character or name to. Give me some of the derivatives of *divide.—Division, divisible, indivisible, dividend, &c.* What did Linnæus characterize and divide?—Animals, vegetables, and minerals. What are these called?—The three kingdoms of nature. How did he characterize minerals?—They grow, &c., &c. State to me in your own words, what you have learned from this sentence.—Linnæus was a great naturalist—He was born in Sweden—He formed all natural objects into three great classes or kingdoms—And he thus distinguished each of these kingdoms from the other: "stones *grow*:" &c. &c.

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# FOURTH BOOK.

## SECTION I.

### LESSON I.

#### ANIMAL AND VEGETABLE LIFE.

LINNÆUS, the great Swedish naturalist, characterizes and divides the three kingdoms of nature, the animal, the vegetable and the mineral, in the following manner: "stones grow; vegetables grow and live; animals grow, live and feel."

These distinguishing properties are, indeed, well *adapted* to exhibit the intended idea, in a popular way; but it may be questioned whether they be *philosophically* just. To grow, live, and feel, are only the passive properties of animals; they possess in general, *active* powers of motion; instinct, and a kind of intellectual energy, which *exalts* them many degrees above vegetables, and *infinitely* above minerals; while the *different* proportions of docility or sagacity with which they are endowed, eminently distinguish the *different* tribes of animated nature from each other, as well as from inanimate matter.

Every animal, from the highest to the lowest rank, is enabled by some natural means, to escape from or *repel* danger, to find security, and to investigate its proper food;

but vegetables are totally unfurnished with any *active* means of defence, and must passively *submit* to every attack and every accident.

Yet, notwithstanding these distinctive characters, which may be *sufficient* to discriminate the boundaries between an animal and a plant, they both possess so many corresponding qualities, that it appears difficult, in some cases, to pronounce when animal life commences, and vegetable life terminates. The sensitive plant, which shrinks from the slightest touch, seems to have as much of perception and locomotive faculty as the polypus. The moving plant furnishes a still more extraordinary example of vegetable motion.

Animals and vegetables, likewise, have both their periods of beginning and maturity, of improvement and decay. They *reproduce* their kind, and have their respective antipathies and propensities. The ferocious animals create a desert around them; and some noxious plants resemble them in this. The strong prey on the weak in both kingdoms of nature; the lion and the manchineel tree cannot *endure* a near approach; the serpent and the poisonous weed occupy a larger space than the harmless useful animal and the salutary plant. The vegetables *produced* in a dry and sunny soil are strong and vigorous, though not prolific and luxuriant; so also are the animals which range in a congenial climate. Warmth and moisture, on the contrary, render vegetables luxuriant and tender, and the animals, assimilating to the nature of such food, are more bulky and flaccid.

Thus, we find in the warm regions of America and Africa, where the sun commonly scorches all the upper grounds and inundations cover all the lower, that even the insect and reptile tribes acquire an extraordinary size. The earth-worm of the tropical climates in America is often a yard long, and as thick as a walking-stick; the boiguacu, or ox serpent, reaches to the length of forty feet; the bats are larger than our *domestic* fowls; and the spiders may vie in size with the frogs and toads of temperate regions. On the contrary, within the arctic circle, where vegetation is impeded by the rigour of the climate, animal life, through all its various classes, sensibly partakes in the diminution.

Again, if we contemplate the animals and vegetables peculiar to the watery world, we shall not fail to find new correspondences, and to recognise how well the nature of the one is *adapted* to the necessities of the other.

Thus it is evident that animals and vegetables have a tendency to approximate towards each other. It may be observed, however, that the more perfect races recede the farthest from vegetable nature; and that in proportion to the inferiority of the animal; the *affinity* of the two classes is perceptibly nearer. Man, the noblest and most perfect of animals, appears to be least affected by the diversity of climate, or influenced by the aliments on which he subsists. From the polar regions to the burning sands of the *equator* he procures with more or less ease, the means of subsistence; he is neither *circumscribed* by zones, nor *confined* to *territories*, but exists in every clime with little alteration in his nature or in his form.

MAYOR.

## LESSON II.

### ON THE MULTITUDE AND VARIETY OF LIVING CREATURES.

If we consider those parts of the material world which lie the nearest to us, and which are therefore *subject* to our observations and *inquiries*, it is amazing to consider the infinity of animals with which it is stocked. Every part of matter is peopled; every green leaf swarms with inhabitants. There is scarcely a single humour in the body of a man, or of any other animal, in which our glasses do not discover myriads of living creatures. The surface of animals is also covered with other animals which are, in the same manner, the bases of other animals, that live upon them; nay, we find in the most solid bodies, as in marble itself, innumerable cells and *cavities*, that are crowded with such *imperceptible* inhabitants as are too little for the naked eye to discover. On the other hand, if we look into the more bulky parts of *nature*, we see the seas, lakes, and rivers, teeming with numberless kinds of living creatures. We find every mountain and marsh, wilderness and wood, plentifully stocked with birds and beasts, and every part of matter affording proper necessaries and conveniences for the livelihood of the *multitudes* which inhabit it.

Nor is the goodness of the Supreme Being less seen in the *diversity* than in the *multitude* of living creatures. Had he only made one species of animals, none of the rest would have enjoyed the happiness of existence. He has, therefore, specified in his creation every degree of life, every *capacity* of being. The whole chasm of nature from a plant to a man, is filled up with *divers* kinds of creatures, rising one over another, by such a gentle and easy *ascent*, that the little transitions and deviations from one species to another are almost insensible. This intermediate space is so well husbanded and *managed*, that there is scarcely a degree of *perception*, which does not *appear* in some one part of the world of life. Now, if the scale of being rises, by such a regular progress, so high as man, we may, by a parity of reason, *suppose* that it still *proceeds* gradually through those beings, which are of a superior *nature* to him; leaving still, however, an infinite gap or chasm between the highest created being and the Power which produced him. In this system of being, there is no creature so wonderful in its *nature*, and which so much deserves our particular attention, as man, who fills up the middle space between the animal and intellectual nature—the visible and invisible world: so that he, who, in one respect, being associated with angels, may look upon a Being of infinite perfection as his father, and the highest order of spirits as his brethren, may, in another respect, say to corruption, "Thou art my father," and to the worm, "Thou art my mother and my sister."

ADDISON.

## LESSON III.

### THE NATURE AND HABITS OF QUADRUPEDS.

The greatest animals are made for inoffensive life, to range the plains and the forests without injuring others;

to live upon the productions of the earth, the grass of the fields, or the tender branches of the trees. These, *secure* in their own strength, neither fly from any other *quadrupeds*, nor yet attack them. Nature to the greatest strength, has added the most gentle dispositions. Without this, these enormous creatures would be more than a match for all ths rest of the creation ; for, what *devastation* might not ensue, were the elephant, or the rhinoceros, or the buffalo as fierce or as mischievous as the tiger or the rat? In order to oppose these large animals, and, in some *measure*, to *prevent* their exuberance, there is a species of the *carnivorous* kind, of inferior strength indeed, but of greater activity and cunning. The lion and the tiger generally watch for the larger kinds of prey, attack them at some disadvantage, and commonly jump upon them by surprise. None of the *carnivorous* kinds, except the dog alone, will make a *voluntary* attack but with odds on their side. They are all cowards by nature and *usually* catch their prey by a bound from some lurking place, seldom attempting to *invade* them openly ; for the larger beasts are too powerful for them, and the smaller too swift. A lion does not willingly attack a horse, and then only when compelled by the keenest hunger. Combats between the lion and the horse are common enough in Italy, where they are both enclosed in a kind of amphitheatre fitted for that purpose. The lion always approaches wheeling about, while the horse presents his hinder legs to the enemy. The lion, in this manner, goes round aud rounnd, still narrowing his circle, till he comes to the proper *distance* to make his spring. Just at the time the lion springs, the horse lashes with both legs from behind, and, in general, the odds are in his favour; it more often happening that the lion is stunned and struck motionless by the blow, than that he effects his jump betweeen the horse's shoulders. If the lion is stunned, and left sprawling, the horse escapes without attempting to improve his victory; but if the lion succeeds, he sticks to his prey and tears the horse in pieces in a very short time.

But it is not among the larger animals of the forest alone, that these *hostilities* are carried on. There is a minute and a still more treacherous contest between the lower ranks of *quadrupeds.* The panther hunts for the sheep and the goat; the mountain cat for the hare or the rabbit; and the wild cat for the squirrel or the mouse. In proportion as each *carnivorous* animal wants strength, it uses all the *assistance* of *patience*, *assiduity*, and cunning. However, the arts of these to pursue are not so great as the tricks of their prey to escape; so that the power of destruction in one class is inferior to the power of safety in the other. Were this otherwise, the forest would soon be dispeopled of the feebler races of animals, and beasts of prey themselves would want at one time that *subsistence* which they lavishly destroyed at another.

Few wild animals seek their prey in the day-time; they are then generally deterred by their fears of men in the *inhabited* countries, and by the excessive heat of the sun in those *extensive* forests that lie towards the south, and in which they reign the undisputed tyrants. As soon as the morning, therefore, appears, the *carnivorous* animals retire to their dens; and the elephant, the horse, the deer, and all the hare kinds, those inoffensive *inhabitants* of the plain, make their appearance. But again at night fall the state of *hostility* begins: the whole forest then echoes to a variety of different howlings. Nothing can be more terrible than an African landscape at the close of evening; the deep-toned roarings of the lion; the shriller yellings of the tiger; the jackal pursuing by the scent and barking like a dog; the hyena, with a note peculiarly solitary and dreadful; but, above all, the hissing of the various kinds of serpents, which then begin their call, and as I am assured, make a much louder *symphony* than the birds in our groves in a morning.

Beasts of prey seldom *devour* each other; nor can any thing, but the greatest degree of hunger, induce them to it. What they chiefly seek after is the deer or the goat, these harmless creatures, that seem made to embellish nature. These are either pursued or surprised, and afford the most agreeable repast to their destroyers. The most usual method, even with the fiercest animals, is to hide and crouch near some path frequented by their prey, or some water where the cattle come to drink, and seize them at once with a bound. The lion and the tiger leap twenty feet at a spring; and this, rather than their swiftness or strength, is what they have most to depend upon for a supply. There is scarcely one of the deer or hare kind, that is not very easily capable of escaping them, by its swiftness; so that, whenever any of these fall a prey, it must be owing to their own *inattention*, But there is another class of the *carnivorous* kind, that hunt by the scent, and which it is more difficult to escape. It is remarkable that all animals of this kind pursue in a pack, and encourage each other by their mutual cries. The jackal, the syagush, the wolf, and the dog are of this kind; they pursue with *patience* rather than swiftness: their prey flies at first and leaves them behind; but they keep on with a *constant* steady pace and excite each other by a general spirit of industry and emulation, till at last they share the common plunder. But it too often happens, that the larger beasts, when they hear the cry of this kind begun, pursue the pack, and, when they have hunted down the animal, come in and monopolize the spoil. This has given rise to the report of the jackal's being the lion's *provider*, while the reality is, that the jackal hunts for himself, and the lion is an unwelcome intruder upon the fruits of his toil.

Of the prey of these *carnivorous* animals, some find *protection* in holes, in which nature has directed them to bury themselves; some find safety by swiftness; and such as are *possessed* of neither of these advantages, generally herd together, and endeavour to repel *invasion* by *united* force. The very sheep, which, to us seem so defenceless are by no means so in a *state* of nature. They are furnished with arms of defence, and a very great degree of swiftness. But they are still further assisted by their spirit of mutual defence; the females fall into the centre; and the males forming a ring round them, oppose their horns to the assailants.

Some animals, that feed upon fruits which are to be found only at one time of the year, fill their holes with several sorts of plants, which enable them to lie concealed during the hard frosts of the winter, contented with their prison, since it affords them plenty and *protection*. These holes are dug with so much art, that there seems the design of an architect in the formation. There are usually two apertures, by one of which the little inhabitants can always escape when the enemy is in *possession* of the other. Many creatures are equally careful of avoiding their enemies, by placing a sentinel to warn them of the approach of danger. These generally perform this duty by turns; and they know how to punish such as have *neglected* their post, or have been unmindful of the common safety.

Such are a part of the efforts that the weaker races of quadrupeds exert to avoid their *invaders*; and in general, they are *attended* with success. The arts of *instinct* are most commonly found an overmatch for the *invasions* of *instinct*. Man is the only creature against whom all their little arts cannot prevail. Wherever he has spread his dominion, scarcely any flight can save, or any retreat harbour. Wherever he comes, terror seems to follow, and all society ceases among the inferior *inhabitants* of the plain. Their *union* against him can yield them no *protection*, and their cunning is but weakness. In their fellow-brutes they have enemies, whom they can oppose with an equality of advantage. They can oppose fraud or swiftness to force, or numbers to *invasion*; but what can be done against such an enemy as man, who finds them out though unseen, and though remote destroys them? Wherever he comes, all contest among the meaner ranks seems to be at an end, or is carried on only by surprise. Such as he has thought proper to *protect* have calmly submitted to his *protection;* such as he has found *convenient* to destroy, carry on an unequal war, and their numbers are every day decreasing.

Goldsmith,

## LESSON IV.

### THE INSTINCT OF BIRDS.

What can we call the *principle* which *directs* every kind of bird to observe a particular plan in the *structure* of its nest, and *directs* all of the same species to work after the same *model?* It cannot be imitation, for though you hatch a crow under a hen, and never let it see any of the works of its own kind, the nest it makes will be the same, to the laying of a stick, with all the rest of the same species. It cannot be reason, for, were animals endued with it to as great a degree as man, their buildings would be as different as ours, according to the different conveniences that they would propose to themselves. Is it not wonderful that the love of the parent should be so violent while it lasts, and that it should last no longer than is necessary for the preservation of the young? So soon as the wants of the latter cease, the mother withdraws her fondness, and leaves them to provide for themselves: and, what is a very remarkable circumstance in this part of instinct, we find that the love of the parent may be lengthened out beyond its usual time, if the preservation of the species requires it; as we may see in birds that drive away their young, as soon as they are able to get their livelihood, but continue to feed them, if they are tied to the nest, or confined within a cage, or by any other means appear to be out of a condition of supplying their own necessities. Yet how wide a difference is there between human reason and animal instinct! Reason shows itself in all the *occurrences* of life; whereas the brute makes no discovery of such a talent, but what *im-*

*mediately* regards his own preservation, or the continuance of his species. Animals in their generation are wiser than the sons of men, but their wisdom is confined to a few particulars, and lies in a very narrow *compass*. Take a brute out of his instinct, and you find him wholly deprived of understanding. To use an instance that often comes under observation :—with what caution does the hen provide herself a nest in places unfrequented and free from noise and *disturbance!* When she has laid her eggs in such a manner that she can cover them, what care does she take in turning them frequently, that all parts may partake of the *vital* warmth. When she leaves them to provide for her necessary subsistence, how punctually does she return before they have time to cool! In summer you find her giving herself greater freedom, and quitting her care for above two hours together; but in winter when the rigour of the season would destroy the young one, she grows more assiduous in her attendance, and stays away but half the time. With how much nicety and attention does she help the chick to break its prison! not to take notice of her covering it from the *injuries* of the weather, providing it proper nourishment, and teaching it to help itself; nor to mention her forsaking the nest, if the young one in due time does not make its appearance. But, at the same time, the hen that has all this seeming ingenuity, considered in other *respects*, is without the least glimmerings of thought or common *sense*. She mistakes a piece of chalk for an egg, and sits upon it in the same manner; she is *insensible* of any increase or diminution in the number of those she lays: she does not distinguish between her own and those of another species; and, when the birth appears of never so different a bird, will cherish it for her own. In all those circumstances which do not carry an *immediate* regard to the subsistence of herself or her species, she is a very idiot. There is not, in my opinion, any thing more mysterious in nature than this instinct in animals, which thus rises above reason, and falls entirely short of it.

ADDISON.

## LESSON V.

### THE COVERING OF ANIMALS.

The covering of different animals is as much to be *admired* as any part of their structure, both for its *variety* and its suitableness to their several natures. We have bristles, hair, wool, furs, feathers, quills, prickles, scales, yet in this diversity, both of material and form, we cannot change one animal's coat for another, without evidently changing it for the worse: taking care, however, to remark, that these coverings are, in many cases, armour as well as clothing, intended for protection as well as warmth. The human animal is the only one which is naked, and the only one which can clothe itself. This is one of the properties which renders man an animal of all climates and of all seasons. He can adapt the warmth or lightness of his covering to the temperature of his habitation. Had he been born with a fleece upon his back, although he might have been comforted by its warmth in cold climates, it would have *oppressed* him by its weight and heat, as the species spread towards the warmer regions. What art, therefore, does for men, nature has, in many instances, done for those animals which are incapable of art. Their clothing, of its own *accord*, changes with their necessities. This is particularly the case with that large tribe of quadrupeds which are covered with furs. Every dealer in hare-skins and rabbit-skins knows how much the fur is thickened by the approach of winter. It seems to be a part of the same *constitution* and the same design, that wool, in hot countries, *degenerates*, as it is called, but in truth, most happily for the animal's ease, passes into hair; whilst, on the contrary, that hair, in the dogs of the polar regions, is turned into wool, or something very like it: to which may be referred, what naturalists have remarked, that bears, wolves, foxes, hares, which do not take the water, have the fur much thicker upon the back than the belly: whereas, in the beaver, it is thicker upon the belly, as are the feathers in water-fowl. We know the final cause of all this, and we know no other.

The covering of birds cannot escape the most *vulgar observation*. Its lightness, its smoothness, its warmth; the disposition of the feathers all *inclined* backward, the down about the stem, the overlapping of their tips, their different configuration in different parts, not to mention their variety of colours, *constitute a vestment* for the body, so beautiful, and so appropriate to the life which the animal is to lead, as that, I think, we should have had no conception of any thing equally perfect, if we had never seen it, nor can now imagine any thing more so. Let us suppose (what is possible only in supposition) a person who had never seen a bird, to be presented with a plucked pheasant, and bid to set his wits to work how to contrive for a covering, which shall unite the qualities of warmth, lightness, and the least resistance to the air, and the highest degree of each; giving it also as much of beauty and of *ornament* as he could afford: he is the person to behold the work of the Deity, in this part of his creation, with the sentiments which are due to it. In the small order of birds which winter with us, from a snipe downwards, let the *external* colour of the feathers be what it will, their Creator has universally given them a bed of black down next their bodies. Black, we know, is the warmest color; and the purpose here is to keep in the heat arising from the heart and circulation of the blood. It is further likewise remarkable, that this is not found in larger birds: for which there is also a reason; small birds are much more exposed to the cold than large ones; forasmuch as they present, in proportion to their bulk, a much larger surface to the air.

PALEY.

## LESSON VI.

### THE SAGACITY OF INSECTS.

The parental instinct of *insects* is well worthy your attention. Not only do these *minute* creatures, when alive, undergo as severe *privations* as the largest quadrupeds in nourishing their offspring, and expose themselves to as great risk in defending them; but, in the very article of death, they exhibit as much *anxiety* for their preservation. A very large proportion of them are doomed to die before their young come into existence; but these, like affectionate parents in *similar* circumstances, employ their last efforts in providing for the offspring that are to succeed them.

Observe the motions of that common white butterfly, which you see flying from herb to herb. You perceive that it is not food she is in pursuit of, for flowers have no *attraction* for her. Her object is to discover a plant that will *supply* the *sustenance* appropriated by Providence to her young, upon which to deposit her eggs. Her own food has been honey drawn from the nectary of a flower. This, therefore, or its neighborhood, we might expect would be the situation she would select for them. But no; as if aware that this food would be to them poison, she is in search of some plant of the cabbage tribe. But how is she to distinguish it from the surrounding vegetables? She is taught of God! Led by an instinct far more *unerring* than the practised eye of the botanist, she recognises the desired plant the moment she approaches it, and upon this she places her *precious* burden; yet not without the further precaution of *ascertaining* that it is not pre-occupied by the eggs of some other butterfly. Having fulfilled this duty, from which no obstacle short of *absolute* impossibility, no danger however threatening, can divert her, the affectionate mother dies.

The dragon-fly is an inhabitant of the air, and could not exist in water; yet in this element, which is alone adapted for her young, she ever carefully drops her eggs. The larvæ of the gad-fly are destined to live in the stomach of the horse. How shall the parent, a two-winged fly, conduct them thither? By a mode truly extraordinary. Flying round the animal, she curiously poises her body for an instant, while she glues a single egg to one of the hairs of his skin ; and she repeats this process until she has fixed in a *similar* way, many hundred eggs. These, after a few days, on the *application* of the slightest moisture attended by warmth, hatch into little grubs. Whenever, therefore, the horse chances to lick any part of his body to which they are attached, the moisture of the tongue *discloses* one or more grubs, which *adhering* to it by means of the saliva, are *conveyed* into the mouth, and thence find their way into the stomach. But here is a question occurs to you. It is but a small portion of the horse's body which he can reach with his tongue: what, you ask, becomes of the eggs deposited in other parts? I will tell you how the gad-fly avoids this dilemma, and I will then ask you if she does not discover a provident forethought, a depth of instinct which almost casts into shade the boasted reason of man. She places her eggs only on those parts of the skin which the horse is able to reach with his tongue: nay, she confines them almost *exclusively* to the knee or the shoulder, which he is seen to lick. What could the most refined reason, the most *precise* adaptation of means to an end, do more?

Not less admirable is the parental instinct of that vast tribe of *insects* known by the name of ichneumons, whose young are destined to feed upon the living bodies of other *insects*. You see this animal alight from the plants, where the caterpillar (which is the appropriate food of her young) is to be met with, run quickly over them, carefully examining every leaf, and having found the unfortunate object of her search, *insert* her sting into its flesh, and there deposit an egg. In vain her victim, as if *conscious* of its fate, writhes its body, spits out an acid *fluid*, and brings into action all the organs of defence with which it is provided. The active ichneumon braves every danger, and does not desist until her courage and address have insured subsistence for one of her future progeny. Perhaps, however, she discovers that she has been forestalled by some precursor of her own tribe, that has already buried an egg in the caterpillar she is examining. In this case she leaves it, aware that it would not suffice for the support of two, and proceeds in search of some other yet unoccupied. The process is of course varied in the case of those minute species, of which several, sometimes as many as a hundred and fifty, can subsist in a single caterpillar. The little ichneumon repeats her *operations* until she has darted into her victim the requisite number of eggs. The larvæ, hatched from the eggs thus ingeniously deposited, find a delicious banquet in the body of the caterpillar, which is sure eventually to fall a victim to their ravages. So accurately, however, is the supply of food proportioned to the demand, that this event does not take place until the young ichneumons have attained their full growth. In this strange and apparently cruel *operation* one circumstance is truly remarkable. The larvæ of the ichneumon, though every day, perhaps, it gnaws the inside of the caterpillar, and though at last it has devoured almost every part of it, except the skin and intestines, carefully all this time avoids injuring the vital organs, as if aware that its own existence *depends* on that of the insect on which it preys. Thus the caterpillar continues to eat, to *digest*, and to move, apparently little injured, to the last, and only perishes when the grub within it no longer requires its aid.

Another tribe of Ichneumons, whose activity and perseverance are equally conspicuous, like the insidious cuckoo, contrive to introduce their eggs into the nest in which bees and other insects have deposited theirs. With this view they are constantly on the watch, and the moment the unsuspecting mother has quitted her cell for the purpose of collecting a store of food or materials, glide into it and leave an egg, the germ of a future assassin of the larva which is to spring from that deposited by its side.

There is a spider common under clods of earth, which may at once be distinguished by a white globular silken bag, about the size of a pea, in which she has deposited her eggs, attached to the extremity of her body. Never miser clung to his treasure with more *tenacious* solicitude than this spider to her bag. Though apparently a considerable incumbrance, she carries it with her everywhere. If you *deprive* her of it, she makes the most strenuous efforts for its recovery; and no personal danger can force her to quit the *precious* load. Are her efforts ineffectual, —a stupifying melancholy seems to seize her, and, when *deprived* of the first object of her cares, existence itself seems to have lost its charms. If she succeeds in regaining her bag, or if you restore it to her, her actions demonstrate the excess of her joy. She eagerly seizes it, and, with the utmost agility, runs off with it to a place of security. Nor is the attachment of this affectionate mother confined to her eggs. After the young spiders are hatched, they make their way out of the bag by an orifice, which she is careful to open for them, and without which they could never escape; and then, like the young of the Surinam toad, they attach themselves in clusters to her back, belly, head, and even legs; and in this situation, where they present a very singular appearance, she carries them about with her, and feeds them until their first moult, when they are big enough to provide their own subsistence.

Kirby *and* Spence.

## LESSON VII.

### THE INSTINCT OF FISHES.

Fishes, it is said, appear inferior to beasts and birds in *acuteness* of sensation and instinctive sagacity; yet scarcely any animal *evinces* more tenderness, care, and *solicitude* for its young than the common whale. She suckles and nurses them with the greatest affection, and takes them with her wherever she goes; when pursued, she carries them on her back, and supports them with her fins; when wounded, she will nor *relinquish* her charge; and when *obliged* to plunge in the midst of her agonies, will clasp them more closely, and sink with them to the bottom.

It is curious to remark what sagacity the finny tribes display in seeking out the most proper places for depositing their spawn. The salmon, in her journey up a river will suffer no obstacle, that she can possibly surmount, to oppose her *progress* to the place of her destination; and in order to attain it, will spring over cataracts several feet high. In going upwards, she will keep at the bottom, where the current is weakest, and, when she returns, will *avail* herself of its strength at the top by swimming near its surface.

The *migration* of the different kinds of fishes is truly astonishing; and it should make us grateful to the providence of God to remark, that it is when plump and in season for eating that they are taught instinctively to throng our bays and creeks, while they *disperse* to the remotest parts of the ocean when lean and emaciated. "Who bids these creatures evacuate the shores," says a popular writer, "and *disperse* themselves into all quarters when they become worthless and unfit for our service? Who rallies and recalls the undisciplined vagrants, as soon as they are improved into desirable food? who appoints the very scenes of our ambush to be the places of their rendezvous, so that they come like volunteers into our nets? Surely, the furlough is signed, the summons issued, and the point of re-union settled by a Providence ever indulgent to mankind; ever studious to treat us with dainties, and load us with *benefits.*"

At the time the land crabs of the West Indies arrive upon the coast to deposit their eggs, numerous fishes of different kinds punctually attend, as if advised of the exact period when they might expect their annual supply. The lamprey makes holes in the gravelly bottom of the river previous to depositing her ova. A curious circumstance has been observed relative to the young sharks, that, when pursued, they will, on the appearance of danger, take *refuge* in the belly of the mother. The ink-fish seems to be well-informed of the use she ought to make of her natural bottle, and, when pursued, discharges its contents in the way of her foe. There is a species of star-fish, which, like the spider, spreads out its net to entangle its unwary *victim.* And the little thresher, in order to get the better of his formidable antagonist, tumbles head over tail, and falls down with astonishing force on the back of the whale, while his ally, the sword-fish, wounds him from underneath.

*Book of Nature.*

## LESSON VIII.

### THE USES OF ANIMALS

Quadrupeds.—The uses of Quadrupeds are so various, that we must content ourselves with naming only a few of them. Of what great utility for the purposes of *agriculture*, travelling, industry, and *commerce*, is that *docile* and tractable animal, the horse! In what a variety of ways do the ox and the sheep administer to our wants? And happily for the world, these creatures are inhabitants of all countries, from the polar circle to the equator. Goats, in many of the mountainous parts of Europe, constitute the wealth of the inhabitants: they lie upon their skins, convert their milk into cheese and butter, and feed upon their flesh. The rein-deer, to the inhabitants of the icy regions, supply the place of the horse, the cow, the sheep, and the goat. The camel is to the Arabian what the rein-deer is to the Laplander. The flesh of the elk is palatable und *nutritious*, and of his skin the North American Indians make snow-shoes and canoes. The elephant, in warm countries, is useful as a beast of burden, and draws as much as six horses; wild male elephants are also frequently hunted and killed on account of their tusks, which constitute the ivory of *commerce*. What an unwearied pattern of unremitting exertion and *fidelity* is that invaluable animal, the shepherd's dog! what *humane* and excellent life-preservers are the Newfoundland species; and what sagacious guides and safe conductors are that useful breed, trained in the Alpine solitudes to carry provisions to the bewildered traveller, and lead his steps to the *hospitable* convent! To what a number of *depredators* would our substance be exposed, were it not for that convenient and agile animal, the cat! The ichneumon is to the Egyptians, in several respects, what the cat is to us. Animals of the weasel kind furnish us with a number of rich and valuable furs; the civet, the genet, and the musk, with a supply of *perfumes;* the beautiful skin of the tiger decorates the seats of justice of the mandarins of the East; the flesh of the white bear is eaten by the Greenlander; that of the leopard is much relished by the African; and the lion, even the lion, the living tomb of so many creatures, is at last frequently eaten by the negroes.

Birds.—The uses of the poultry kind, especially of such as are domesticated, are too *obvious* to be enumerated: it may, however, be remarked, that the common hen, if well supplied with food and water, is said to lay sometimes two hundred eggs in a year; and the fecundity of the pigeon, in its domestic state, is so great, that from a single pair nearly fifteen thousand may be produced in four years. The flesh of the grouse kind is esteemed for its delicacy. The peacock, in some countries, is considered a *luxury*. It is in a great measure for its singular plumage that man has been tempted to follow the ostrich in its desert retreat; but some of the African tribes are also very fond of its flesh, and its strength and swiftness seem to render it very fit for the purposes of travelling and carrying burdens. If in the feathery tribes, some appear to be formed to please us with the beauty of their plumage, as the goldfinch, the bullfinch, and the hummingbird; others, as the thrush, the blackbird, and the canary, delight us with the *melody* of their song. The lark soars aloft and salutes the new-born day with his cheerful notes. The nightingale soothes the weary laborer, as he returns from his daily toil, by its fascinating strains. The little robin, in return for the protection our fences have afforded him, exerts himself to render the hedges *vocal* in soft and tender *melody*. The swallow, as if sensible of the undisturbed possession she has been allowed to take of our windows and roofs, during the time of her necessities, catches upon the wing a multitude of flies, gnats, and beetles, and thus frees us from a number of troublesome vermin before she bids us farewell. Birds of the rook and pie kind, although a noisy and chattering tribe, may be of infinitely more use than we are able to discover, by the destruction of grubs, worms, and eggs of vermin; and the common carrion-crow may be no less necessary in our climate, than the vulture in Egypt and the ossifrage in Syria. In many warm countries, the vulture is of singular use. Numerous flocks of them are always hovering in the neighbourhood of Grand Cairo; and for the services the inhabitants experience, by these animals devouring the carrion and filth of that great city, which in such a sultry climate, would otherwise soon *putrefy* and *corrupt* the air, they are not permitted to be destroyed.

The ossifrage of the woods of Syria and Egypt feeds on the dead carcasses of fowls and *reptiles.*

INSECTS.—From the number of animals in the different elements and regions of existence, which prey upon insects, we are almost led to infer, that the principal object which the Creator had in view in forming them, was the subsistence of the larger orders of creatures; but the following specimens seem to show that some of these also *contribute,* in no small degree, to the service of man. By the labors and exertions of the bee, we are provided with stores of honey and wax. The seemingly contemptible little silk-worm presents us, in its passage from the caterpillar to the sleeping state, with materials for constituting our most costly raiment. The cantharides, or Spanish flies, are of incalculable *importance* as the basis of blistering plaster, and also as an *internal* remedy in several diseases; and the cochineal furnishes us with a rich and beautiful dye.

REPTILES.—It has already been hinted that some animals of prey are of the greatest service, by devouring these substances, which, if left to rot unburied, would *corrupt the atmosphere.* Amongst animals of this description, we may undoubtedly reckon the race of *serpents;* and whether we consider the fitness of their bodies for entering the dens, caves, and holes of the earth, or their voracious *appetite* for this sort of food, in common with reptiles of an *inferior* order, we must certainly allow that they are wonderfully adapted for the purpose. This, then, is one very *important* use which they serve: besides help-ing to rid the earth of a vast number of the smaller *obnoxious* vermin, they find their way, with the greatest ease, into the most secret recesses of *putrefaction*, and destroy those noisome carcasses, to which the other large animals of similar tastes could not, by the peculiar structure of their bodies, have had access. The use of the leech, another of the *reptile* tribe, is too well known to need description.

FISHES—Some of the tribes of fishes may serve the same purpose in the water that the carrion devourers do on land. But it is chiefly as an *article* of food that the tenants of the ocean are to be prized; and it is matter of thankfulness that the benefits which they impart are most extensively *diffused*. While our lakes, rivers, and streams abound with these living creatures, the ocean conveys them in myriads to the ends of the earth, and presents the bounties of an indulgent parent to his numerous children, however scattered among the isles of the sea. The turbot has been styled the *pheasant of the waters*, on account of its exquisite relish; the sturgeon has been *denominated* a royal luxury; and while the salmon is held in much esteem by the great, the poor have reason to praise the Almighty for an abundant supply of cheap, wholesome, and *nutritious* food, in those prodigious shoals of herrings and pilchards which visit our coasts. Nor have we less reason to be thankful for the incalculable number of cod and other white fish which are drawn from the ocean; and for those *inexhaustible* stores of cartilaginous flat fish, which furnish the laborer with his cheap *repast*. Even the great Greenland whale, which abounds in such numbers in the northern ocean, is said to furnish the inhabitants of those countries which border on its haunts with a delicious *luxury* in the *article* of food. This fish, however, is better known on account of its *importance* in furnishing oil and whalebone; every whale yielding on an average, from sixty to one hundred barrels of oil; which with the whalebone, a substance taken from the upper jaw, renders the creatures very valuable in a *commercial* point of view. From the cachalot we derive that valuable commodity, spermaceti; and ambergris, the sweetest of *perfumes*, is also frequently found in this animal. The skins of sharks and dog-fish are converted into shagreen. From a species of the sturgeon we are supplied with isinglass, and also with a kind of food called caviare, in great request in Russia.

Shell fish furnish so much of their food to the larger orders of the finny tribe, that, as in the case of insects, it would almost appear that they were called into existence for that purpose. But many of them also *contribute* to the subsistence, comfort, and *luxury* of the human race. The hawk's-bill turtle is valued on account of its shell, from which beautiful snuff boxes and other trinkets are formed. The green turtle, as a wholesome and highly delicious food, has become such a valuable *article* in *commerce*, that our West India vessels are now generally fitted up with conveniences for *importing* them alive. Among the shell-fish on the Waterford coast, the murex, which yielded the Tyrian purple, is said to exist. The oyster is much prized for the delicacy of its flavour; in one species of it is also found that beautiful substance called pearl. The pearls are searched for by divers, who sometimes descend from fifty or sixty feet, each bringing up a net full of oysters. The pearl is most commonly attached to the inside of the shell, but is most perfect when found in the animal itself.

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## LESSON IX.

### CLOTHING FROM ANIMALS.

In the hide of an animal, the hair and skin are two entirely distinct things, and must be considered separately as materials for clothing. The hair of *quadrupeds* differs much in fineness. It is chiefly the smaller species which are provided with those soft, thick, glossy coverings that bear the name of fur, and they are found in the greatest perfection where they are most wanted, that is in the coldest countries. They form indeed the riches of those dreary wastes which produce nothing else for human use. The animals most esteemed for their fur are of the weasel kind ; the glutton, the marten, the sable, and the ermine. Fur is either used growing to the skin, or separated from it. In its detached state it is usually employed in making a stuff called felt. The scales of the hair are so disposed, that they make no resistance to the finger drawn along the hair from the root to the point, but cause a roughness and resistance in a contrary direction. From this property, hairs when beaten or pressed together, are disposed to twist round each other, and thus to cohere into a mass. It is in the manufacture of hats that felting is chiefly practised ; and the fur used for this purpose is that of the beaver, the rabbit, and the hare.

Wool differs from common hair, in being more soft and supple and more disposed to curl. These properties it owes to a degree of *unctuosity*, or greasiness, which is with difficulty separated from it. The whole wool, as taken from the animal's body, is called a fleece. The first operation this undergoes is that of picking and sorting into the different kinds of wool of which it is composed. These are next cleansed from marks and stains, and freed from their offensive greasiness. The wool is then delivered to the wool-comber, who, by means of iron-spiked combs draws out the fibres, smooths and straightens them, separates the refuse, and brings it into a state fit for the spinner. The spinner forms the wool into threads which are more or less twisted, according to the manufacture for which they are designed: the more twisted forming worsted, the looser yarn. The kinds of stuffs made wholly or partly of wool are extremely various; and Great Britain produces more of them, and in general of better quality, than any other country. A more perfect manufacture than our broad-cloths, with respect to beauty and utility, cannot easily be conceived. The threads in it are so *concealed* by a fine nap or down raised on the surface, and curiously smoothed and glossed, that it looks more like a rich *texture* of nature's forming, than the work of the weaver. Wool, in common with other animal substances, takes a dye better than any vegetable matters. Our cloths are therefore made of every hue that can be desired; but, in order to fit them for the dyer, they are first freed from all greasiness and foulness by the operation of fulling, in which the cloths are beaten by heavy *mallets* as they lie in water, with which a quantity of fuller's earth has been mixed. This earth unites with the greasy matter and renders it soluble in water; so that by continually supplying fresh streams while the beating is going on, all the foulness is at length carried off. The operation of fulling has the further effect of thickening the cloth, and rendering it more firm and *compact*, by mixing the threads with each other, something in the manner of a felt. The cloths of inferior fineness are mostly called narrow cloths. Some of those used for great-coats, by their substance and shagginess, resemble the original fleece, or rather the fur of a bear, and render unnecessary the use of furred garments. Indeed, with the single material of wool, art has been able much better to suit the different wants of man in his clothing, than can be done by all the productions of nature. What could be so comfortable for our beds as blankets? What so warm, and at the same time so light, for pained and palsied limbs, as flannel? The several kinds of the worsted manufacture are excellent for that elasticity which makes them sit close to a part without impeding its motions. This quality is particularly observable in stockings made of worsted. Even the thinnest of the woollen *fabrics* possess a considerable degree of warmth, as appears in shawls. The real shawls are made of the fine wool of Thibet, in the eastern part of Asia; but they have been very well imitated by the product of some of our English looms. Carpeting is another article made of wool, equally appropriated to luxury.

Men must have been far advanced in the observation of nature, before they found out a material for clothing in the labors of a caterpillar. China appears to have been the first country to make use of the web spun by the silkworm. This creature, which, in its perfect state, is a kind of moth, is hatched from the egg, in the form of a caterpillar, and passes from that state successively to those of a chrysalis, and of a winged insect. While a caterpillar it eats voraciously, its proper and favorite food, being the leaves of the different species of mulberry. By this diet it is not only nourished, but is enabled to lay up, in receptacles within its body, formed for the purpose, a kind of transparent glue, which has the property of hardening as soon as it comes into the air. When arrived at full *maturity*, it spins itself a web out of this gluey matter, within which it is to lie safe and *concealed* during its transformation into the helpless and motionless state of a chrysalis. The silkworm's web is an oval ball, called a cocoon, of a hue varying from light straw colour to full yellow, and consisting of a single thread wound round and round, so as to make a close and impenetrable covering. The thread is so very fine, that when unravelled, it has been measured to seven hundred or one thousand feet, all rolled within the compass of a pigeon's egg. In a state of nature, the silk-worm makes its cocoon upon the mulberry-tree itself, when it shines like a golden fruit among the leaves; and in the southern parts of China, and other warm countries of the East, it is still suffered to do so, the cocoons being gathered from the trees without further trouble. But, in even the warmest climates of Europe, the *inclemency* of the weather in spring, when the worms are hatched, will not permit the rearing of them in the open air. They are kept, therefore, in warm but airy rooms constructed for the purpose, and are regularly fed with mulberry-leaves till the period of their full growth. As this tree is one of the latest in leafing, silk-worms cannot advantageously be reared in cold climates. During their growth, they several times shed their skin, and many die under this operation. At length they become so full of the silky matter, that it gives them a yellowish tinge and they cease to eat. Twigs are then presented to them on little stages of wicker-work, on which they immediately begin to form their webs. When the cocoons are finished, a small number, reserved for breeding, are suffered to eat their way out in their butterfly state; and the rest are killed in the chrysalis state, by exposing the cocoons to the heat of an oven. The next business is to wind off the silk. After separating a downy matter from the outside of the cocoon, called floss, they are thrown into warm water; and the ends of the threads being found, several are joined together, and wound in a single one upon a reel. This is the silk in its natural state, called raw silk. It next undergoes some operations to cleanse and render it more supple: after which it is made into what is called organzine, or thrown silk, being twisted into thread of such different degrees of fineness as are wanted in the different manufactures. This is done in the large way by mills of curious construction, which turn at once a vast number of spindles, and perform at the same time the processes of unwinding, twisting, reeling, &c. The largest and most complicated machine for this purpose in England is at Derby, the model of which was *clandestinely* brought from Italy, where all the branches of the silk manufacture have long flourished. The excellence of silk, as a material for clothing, consists in its strength, lightness, lustre, and readiness in taking dyes. When little known in Europe, it was highly prized for its *rarity:* it is now esteemed for its real beauty and other valuable qualities. As it can never be produced in great abundance, it must always be a dear article of clothing. The *fabrics* of silk are very numerous, and almost all *devoted* to the purposes of show and luxury. In thickness they vary from the finest gauze to velvet, the pile of which renders it as close and warm as fur. Some of the most beautiful of the silk manufactures are the glossy satin; the elegant damask, of which the flowers are of the same hue with the piece, and only show themselves from the difference of shade; the rich brocade, in which flowers of natural colors, or of gold and silver thread, are interwoven; and the infinitely varied ribands. It is also a common material for stockings, gloves, buttons, strings, &c., in which its durability almost *compensates* for its dearness. Much is used for the purpose of sewing, no other thread approaching it in strength. Silk, in short, bears the same superiority among clothing materials that gold does among metals; it gives an appearance of richness wherever it is employed, and confers a real value. Even the refuse of silk is carefully collected, and serves for useful purposes. The down about cocoons, and the waste separated in the operations raw silk undergoes, are spun into a coarser thread, of which very serviceable stockings are made; and the interior part of the cocoon is reckoned the best material for making artificial flowers.

Whilst the covering of the skins of animals affords a valuable material for clothing, the skin itself is not less useful. It requires, however, greater previous *preparation.* It is necessary to impregnate it with a matter capable of preserving it from putrefaction, and at the same time to keep it in a state of flexibility and suppleness. When this is effected, the skin becomes leather, a substance of the highest utility, as well in clothing as for numerous other purposes. The principal operation in the *preparation* of leather is tanning. The hide taken off with due care by the skinner, is first thrown into a pit with water alone, in order to free it from dirt. After lying a day or two, it is placed upon a solid half-cylinder of stone, called a beam, when it is cleared of any adhering fat or flesh. It is then put into a pit, containing a *mixture* of lime and water, in which it is kept about a fortnight. The intent of this is to swell and thicken the hide, and to loosen the hair. Being now replaced upon the beam, the hair is scraped off, and it is next committed to the mastering pit. The contents of this are some animal dung (pigeon's is preferred) and water, and its operation is to reduce that thickening which the lime had given. After this is effected, it is again cleansed on the beam, and is then put into the proper tanning liquor, called ooze, which is an infusion of coarsely-powdered oak-bark in water. The bark of the oak, as well as every other part of it, abounds in strongly *astringent* matter; and it is the thorough impregnation with this which preserves the hide from decay or putrefaction. When at length it is thought to have *imbibed* enough of the *astringent* matter, the hide is taken out and hung upon a pole to drain, after which it is put upon a piece of wood with a convex surface called a horse, on which it is stretched and kept smooth and even. Finally it is taken to the drying-house, a covered building with apertures for the free admission of air; and it is there hung up till it becomes completely dry; and thus the process of tanning is finished. From the tanner the hide or skin is *consigned* to the currier, whose art is further necessary in order to make it perfect leather. He first soaks it thoroughly in water, and then places it upon a beam made of hard wood, with one side sloping and polished. He lays it with the grain side or that on which the hair grew, inwards, and the flesh-side outwards. He then with a broad two-edged knife, having a handle at each end, shaves or pares the hide on the latter side, till all its inequalities are *removed*, and it is reduced to the degree of thinness required for use. After this operation, it is again put into water, then scoured and rubbed with a polished stone. It is next besmeared with a kind of oil procured from sheep or deer skin, or made by boiling train oil and tallow together, with a view to soften or supple it. A great part of its moisture is then *evaporated* by hanging it up in a drying-house for some days; and it is further dried by exposure to the sun, or to the heat of a stove. It is then differently treated, according as it is meant to be blacked or stained, or not. Without entering into minute particulars, it is enough to observe, that the *astringent* principle with which the leather has been impregnated in the tanning renders nothing necessary except the solution of vitriol of iron, at once to strike a good black. This is laid on with a brush, generally on the grain side of the leather, and it afterwards undergoes the operation of giving it that roughness which is called the grain. This is performed by rubbing it in all directions with a fluted board. When leather is blackened on the flesh side, the colour is given by a *mixture* of lamp-black and oil.

Such is the manner in which leather is *prepared* for the making of shoes and boots, which is one of the principal uses of this material; and certainly no other substance could so well unite strength and suppleness with the property of keeping out water. The hides principally used in the shoe-manufacture are those of neat cattle, or the ox kind. For more delicate work, the skin of the goat, dog, seal, and some other animals, are employed. These are sometimes made into leathers by a different mode, called tawing, which is chiefly practised upon kid skins, for the manufacture of fine gloves. The skin is first washed and then soaked in lime-water, in order to get rid of the hair and grease. It is then softened in warm water and bran, and stretched out to dry, which renders it transparent. The preservative liquor is next applied, which is here not a vegetable *astringent*, but a solution of alum and common salt. With this it is impregnated so as to admit of keeping in that state for several months. The next operation is to wash out the superfluous salts with warm water, which must be done with great nicety. Afterwards it is moderately dried, and thrown into a tub in which yolks of eggs have been well mixed by beating. The skins are trodden in this, till all the egg is *incorporated* with their subtance, which is thereby rendered more solid, and at the same time soft and pliable. Blood is sometimes, for cheapness, used instead of eggs; but it communicates a color which cannot entirely be discharged. The skins are then dried again, when they become fit either for taking a dye, or for being glossed, if preserved white. The mode of preparing goat-skins for the celebrated morocco leather resembles this: but the thickening matter, in which the skins are trodden, is a bath of white figs with water.

AIKIN.

## LESSON X.

### ON THE ADAPTATION OF PLANTS TO THEIR RESPECTIVE COUNTRIES.

"A hundred thousand species of plants upon the surface of the earth!" you *exclaim*. Yes, and what is more surprising still, every one of these species has its native country, some particular region, or peculiar spot, on the surface of the globe, to which, in its constitution and formation, it is peculiarly adapted. Some are formed to spring up into luxuriance beneath the scorching rays of a tropical sun; some are so constituted as to *vegetate* beneath the snow, and to withstand the severity of a polar winter; some are made to deck the valley with their variegated beauties; and some are formed "to blush unseen, and waste their sweetness on the desert air," amidst Alpine solitudes: but there is not one of these numerous plants which has not its particular place assigned to it. It would be equally vain to attempt to make some of these *vegetable* forms change their places (without a *corresponding* change of temperature) with impunity, as it would be tō make the experiment of removing the finny inhabitants of the ocean from their native element, in order to make them harmonize and live in comfort among the feathery tenants of the grove. The wisdom and goodness of the *Deity* are indeed no less manifested in the *geographical* distribution, than in the curious process observed in the *vegetation*, the wonderful structure, and other striking peculiarities of plants. We have not room to multiply instances. But where, it may be asked, could the *dense* woods, which constitute the Brazilian forest, be more appropriately situated? Where could the delightful vistas, and pleasant walks, and refreshing *arbours* of the many-trunked banian tree be better placed? Where could that numerous host of natural *umbrellas*, the family of the palms, which overshadow, with their luxuriant and projecting foliage, almost every island, rock, and sand-bank between the tropics, display their cooling shades with better effect? Where, in short, could that wonderful *exuberance* of the earth's bounty, the bread fruit-tree, by which, in the words of Captain Cook, "If a man plant but ten trees in his whole lifetime, (and that he may do in an hour,) he will as completely fulfil his duty to his own, and to future generations, as the natives of our less temperate climate can do by ploughing in the winter's cold, and reaping in the summer's heat, as often as these seasons return:" where, I say, can this *exuberance* be more beneficially manifested than in those regions where "the same glowing beams of the sun that raises the plant into a shrub, and the shrub into a tree," render the gloom of the forest, and the intervening screen of the overhanging *foliage* so desirable, where the least exertion becomes oppressive, and coolness and ease may be said to constitute the principal wants of the inhabitants? And where, it may be further enquired, could those immense fields, upon which are raised our various crops of corn, be better made to expand their extensive surfaces, and lay open their treasures to the influence of the sun, than in those temperate regions of the globe, where, instead of being hurtful, a moderate degree of labour is conducive to health, and the agricultural labourer goes forth to his work in the morning, and returns in the evening, rather *invigorated* than exhausted by the ordinary occupations of the day? If we extend our views much further to the north, we may in vain look for the spontaneous luxuriance of the torrid zone, or the golden coloured fields of the intervening climates; but here we shall find, what is at once more suitable to the climate and the wants of its inhabitants, a plentiful supply of the reindeer-lichen, which being formed by nature to *vegetate* beneath the snow, is there found out in requisite abundance, by that useful creature the name of which it bears, and which is of itself a treasure to the inhabitants of those regions. The *esculent* properties of Iceland-moss are now beginning to be better understood; and in what part of the habitable world could this singularly nutritious *vegetable* have been more *judiciously* and mercifully made to abound, than in that island of wonderful contrasts, where the variable climate is often so unfavorable to *vegetation* of a larger growth, and the hopes of the husbandman are so repeatedly dissappointed by unwelcome visitants, in the form of icy particles floating in the air? The pitcher-plant of the eastern, and the milk or cow-tree of the western world, may each of them be reckoned among nature's wonderful contrivances, and be justly regarded as evidences of the wisdom and goodness of the Being, who knows so well how to proportion the acts of his bounty to the necessities and wants of his creatures. The singular appendages which form the extremities of the pitcher-plant are so many urns, containing a clear, wholesome, and well-tasted water. In the morning the lid is closed, but it opens during the day, when a portion of the water evaporates; this, however, is *replenished* in the night; and each morning the vessel is full and the lid shut. As this plant grows in sultry climates, and is found in the Island of Java, in the most stony and arid situations, how welcome and *exhilirating* must the sight of it often be to the weary traveller; and, from the marks of teeth upon the vessel, it has been said that "it is evident that beasts often supply their wants at the same plenteous source." The milk tree, or cow-tree, so called on account of the resemblance its singular juice bears to the milk of animals, in place of which M. Humboldt has seen it used for every domestic purpose, is thus described by that enterprising traveller:—"I confess that among the great number of curious phenomena which I have observed in the course of my travels, there are few which have made a stronger impression on my mind than the cow-tree. On the barren *declivities* of a rock grows a tree, whose leaves are dry and *coriaceous;* its thick *ligneous* roots scarcely enter the rock; for several months in the year rain scarcely waters its fan-shaped leaves; the branches appear dry and dead; but when an incision is made in the trunk, a sweet and nutritious milk flows from it. It is at the rising of the sun that the *vegetable liquid* runs most abundantly; then the natives and negroes are seen to come from all parts, provided with vessels to receive the milk, which becomes yellow, and thickens at the surface. Some empty their vessels under the same tree; others carry them home to their children. It is like a shepherd distributing to his family the milk of his flock. If those who possess these precious trees near their habitation drink with so much pleasure their beneficent juice, with what delight will the traveller, who penetrates these mountains, appease with it his hunger and thirst?" The few instances here recorded may serve as general specimens of that wise ordination, universally to be observed, if duly attended to, in the *geographical* arrangement and distribution of vegetables.

*Popular Philosophy.*

## LESSON XI.

### THE USES OF VEGETABLES.

TREES.—These *stupendous* specimens of creative power spread not their wide-extended roots, nor lift their lofty heads, in vain. Beneath their cooling shades our flocks and herds find a comfortable asylum from the scorching rays of the summer sun: the wild stragglers of the forest have a place of refuge among their woods and thickets, whilst the feathery songsters of the grove build their little dwellings in security, and sing among their branches. But in what a variety of respects, besides affording the inhabitants of warm climates an agreeable shelter from the mid-day heat, are they made subservient to the use of man! Some, as the bread-fruit tree of the Pacific Ocean, the cabbage-tree of East Florida, the tea-tree of China, the sugar-maple tree of America, the coffee-tree and sugar-cane of the West Indies, and the numerous luxuriant fruit-bearing trees scattered over the face of the globe, contribute to our wants in the form of food. The fountain-tree on one of the Canary Islands is said by voyagers to furnish the inhabitants with water; while the paper-mulberry-tree of the Southern Ocean, and the cotton-shrub of America, provide us with materials for clothing. The candleberry-myrtle presents the inhabitants of Nankin with a substitute for animal tallow. The salt-tree of Chili yields a daily supply of fine salt. The cinnamon, nutmeg, clove, and pimento, furnish us with spices. The Jesuit's-bark, manna, senna, and others, produce a variety of simple but useful *medicines.* Some trees yield a precious balsam for the healing of wounds; some a quantity of turpentine and resin; and others give out valuable oils and gums. Nor are trees serviceable only in a natural state. By the assistance of art, some are converted into houses to protect man from the inclemency of the weather, or are moulded into a variety of forms for the purposes of building and domestic comfort; others raise the huge fabric of the floating castle, or bulky merchant ship, by which our shores are protected from foreign invasion, and articles of industry and commerce transported to the remotest regions.

SHRUBS.—Much that has already been said respecting the utility of trees, may also be applied to shrubs; but there are three particulars in which the latter may be said to differ from the former, and on which depends much of their usefulness to man. The first of these is their stature, the second their greater pliability, and the third the prickly *armour* with which many of them are covered. Some shrubs, as the gooseberry, the rasp, and the curran bushes, so common in our gardens, *gratify* the palate, and temper the blood, during the summer months, with agreeable and cooling fruit; others, as the rose, delight and please the eye by the beauty of their flowers, or, as the sweet-scented briar, regale the *olfactory nerves* with the fragrance of their perfumes. But how could these several ends have been accomplished, if, by a more exalted exposure, the fruit-bearing bushes had placed their treasures beyond our reach, the rose with its back turned to us, had been " born to blush unseen," and each *aromatic* shrub, removed far above the sense of smelling had *literally* been left,

" To waste its sweetness on the desert air."

With regard to that considerable share of pliant elasticity possessed by some, how easily does it admit the branches to be turned aside, and to *resume* their former position, in gathering the fruit or flowers! and how serviceable does this property enable us to make some of them in the form of hoops, baskets, or wicker-work of any description! while the sharp-pointed prickles with which they are armed, not only serve as weapons of defence to themselves, but furnish us with cheap and secure fences against the inroads of straggling cattle, and the unwelcome *intrusion* of the unprincipled *vagrant.*

HERBS.—These, in an especial manner, may be said to constitute the food of man and beast, as well as to yield their assistance in an infinity of ways; and behold in what profusion they spring forth? in what numerous bands they appear! Yonder a field of golden-eared wheat presents to the view a most *prolific* crop of what forms the chief part of the staff of life. Here a few acres of longbearded barley ripen, to provide us with our favorite beverage. On the right hand, stand the tall-growing and slender oats and the flowering potatoes, to revive and nourish the hopes of the poor; while, on the left, the heavy-laden bean, and low-creeping pea, in lengthened files, vegetate to furnish provender for our horses; or the globular turnip increases its swelling bulk, to lay up for our herds a supply of food, when the softer *herbage* of the field is locked up by the *congealing* powers of winter. What a spontaneous crop of luxuriant herbage do our meadows present in the appointed season! and in what a profusion of wholesome pasture do the numerous flocks of sheep and cattle roam! Whether they frequent the solitary holm beside the still waters, or range the pathless steep, still they are followed by the goodness of the Lord. Myriads of grassy tufts spring up on every side, and they are *satisfied* out of the treasures of Providence. But the *herbaceous* productions of the field are not universally *calculated* for the purposes of food. In some places numerous groups of tall, thin, *flexible* plants make their appearance, whose filmy coats being properly manufactured, are converted into the most costly and delicate raiment; while others of a coarser texture furnish the *mariner* with wings to his vessel, cordage to tighten his masts, or the *ponderous* cable to stay his bark in the midst of the *fluctuating* element. Yet even here their services do not end, for when worn out in one shape they *assume* another, and not only furnish the material from which is formed the wrapper of the manufacturer, and the package of the merchant, but that invaluable article upon which we write—upon which we are able to hold converse with friends at a distance—and by means of which man transmits his thoughts to man, and generations unborn are enabled to hold converse with past ages. By means of these pliant productions we are also supplied with a variety of seeds and oils, of much request in common life; and wherever disease is known, there, we have reason to believe, *medical* herbs spring up as antidotes: some communicating their healing virtues by the root, some by the leaves, and others by the flowers or seeds. A number of these, and many others of the greatest utility in *medicine*, come forth in various places of the globe without the aid of art, and are found growing wild among the herbs of the field.

FLOWERS.—But for what purpose do these charming flowers come forth? Is it merely to please our eyes with the brilliant colours, and regale the sense of smelling with their *odoriferous* perfumes, that they unfold their fascinating beauties, and emit their pleasing fragrance? Or is it to attract those numerous insects which swarm among them, and riot amidst their liquid sweets? That flowers were designed for both these purposes is apparent from the sensations which we experience when we visit the delightful spots where they grow, and from the assiduous eagerness which the busy bee evinces in roaming from flower to flower, to extract their balmy juices. But there is another, and that a most important use, to which the flowery tribe may be made subservient:

"In reason's ear they become preachers."

The upright philosopher of the land of Uz, and that devout admirer of the works of nature, David, king of Israel, both took *occasion* to compare the uncertain tenure of human life to the frail and perishable state of a flower. The prophet Isaiah represents the *transient* glory of the crown of pride as being like one of these fading beauties; and our Saviour has *demonstrated* that an important lesson against too anxious care, and pride in dress, may be learned from a right consideration of these gay visitants:—"Consider the lilies how they grow: they toil not, neither do they spin; and yet, I say unto you, that Solomon in all his glory was not arrayed like one of these."

*Book of Nature.*

## LESSON XII.

### CLOTHING FROM VEGETABLES.

The vegetable matters employed for clothing are chiefly of two kinds; the *fibres* of plants, and the downy substance in which the seeds are sometimes imbedded. The *fibrous* or stringy texture is very prevalent in vegetables. We see it in the bark and wood of trees, in the stalks of green or herbaceous plants, and in the leaves of all. The longer parallel fibres are held together by shorter cross ones, forming a net work, cemented by a *glutinous* matter. The ingenious, though but half-*civilized* people of Otaheite have discovered a method of making tolerable cloth of the inner bark of certain trees, by steeping it in water, and then beating it with a wooden mallet. But the more artful way of employing vegetable fibres consists in an entire separation of them from the matter that held them together, reducing them to clean loose bundles, then twisting them into threads, and lastly, interweaving them.

The plants selected in Europe for the purpose of making thread and cloth from their fibres are chiefly flax and hemp. Flax (in Latin *linum*, whence the word linen) is an *annual* plant, rising on a single stalk to a moderate height, and crowned with handsome blue flowers, succeeded by *globular* seed-vessels. It is suffered to grow till the seeds are ripe, and is then plucked up by the hand, laid in little bundles to dry, deprived of its seed-vessels, and then put in pits of water to rot. The purpose of this part of the process is to dissolve a *mucilaginous* matter which holds the fibres together, and it is the most disagreeable part of the management of flax, as the smell arising from it while rotting is extremely offensive, and prejudicial to the health. When the flax has lain long enough, it is taken out, washed, dried, then beaten with mallets, combed, and by various other operations so prepared, that the long fibres are got by themselves, clean and loose, in which state they are called flax ; the shorter and coarser fibres, separated by the comb, are called tow. The operation of spinning, which it next undergoes, consists in drawing out, with the fingers, several of the fibres together, and twisting them. The product of spinning is thread, which is more or less fine according to the *dexterity* of the spinner and the nature of the material. Some thread, closer twisted than the rest, is kept for needlework, but the greater part is made up in bundles, called linen-yarn, and committed to the weaver. Weaving may be regarded as a finer kind of matting. To perform it, the threads, which form the length of a piece of cloth, are first disposed in order, and strained by weights to a proper tightness ; this is called the warp. These threads are divided by an instrument called a reed, into two sets, each composed of every other thread; and while, by the working of a treddle, each set is thrown *alternately* up and down, the cross-threads, called the *woof* or *weft*, are inserted between them, by means of a little instrument, sharp at both ends, called a *shuttle*, which is briskly shot from one of the weaver's hands to the other, placed on the opposite side of the work, and carries the thread with it. This is the simplest kind of weaving; but numberless are the *additional* contrivances made for all the curious works wrought in the loom, which have been the objects of human ingenuity for many ages. The linen fabrics are of all degrees of fineness, from coarse sheeting to cambric, almost emulating a spider's web. They are brought to that extreme whiteness which we so much admire, by the process of bleaching. This consists in their exposure to the action of the sun and air, with frequent watering, and often with the help of some acid liquor, which quickens the operation. The value that can be given to a raw material by manufacturing, is in few instances more strikingly exemplified than in the conversion of flax into Brussels lace, some of which sells for several guineas a-yard.—Indeed, if you look at a plant of flax growing, and then at the frill of your shirt, you cannot fail to be struck with admiration of human skill and industry.

Hemp is a much taller and stronger plant than flax. It has a square rough stalk rising to the height of five or six feet, and sending off branches. Its *fibrous* part consists in the bark surrounding the main stalk. Hemp undergoes the same general preparations as flax before it is consigned to the weaver; but being of a stronger and coarser texture, it requires more labor to get the fine fibres separated from the rest. Hence it is commonly employed in the more homely manufactures; it is the principal material of sail-cloth, a fabric, the strength of which is required to be proportional to the violence it has to undergo from storms and tempests; and it is equally important to *navigation*, from its use in making cordage; for which purpose it is taken entirely in a raw state, and twisted into coarse twine, which is afterwards united to make rope.

Whilst the inhabitant of the northern and temperate regions is obliged to *exercise* much labour and contrivance in procuring his vegetable clothing from the stalks of plants, the native of the fruitful south enjoys the benefit of a material presented in greater abundance, and in a state requiring much less preparation before it is fitted for the manufacturer. This is cotton, a white woolly substance contained in the seed-pod of a family of plants, some of which are *annual* and herbaceous, others *perennial* and shrubby. The pods, when ripe, open of themselves, and the cotton is plucked out of them by the fingers, with the seeds sticking to it; these are separated by means of mills, which pull out and loosen the down. It is then in a state fit to be sent from the planter to the manufacturer. The further operations it undergoes are picking, carding, and roving, which last brings off the fibres *longitudinally*, in a continued loose line; these are next twisted and drawn out, so as to make thread or yarn, and the material is then consigned to the weaver. The vast extension of the cotton manufacture in this country has caused these operations to be performed by a system of complex machinery, the invention of the late Sir Richard Arkwright. The fabrics made from cotton are *probably* more various and numerous than from any other material. They *comprehend* stuffs of all degrees of fineness, from the transparent muslin of a robe, or a turban, to the thick plush and warm bed-quilt. The commerce of Great Britain has, of late years, been peculiarly *indebted* to the cotton manufacture, which produces clothing for people of all ranks, from Russia to Guinea, and unites elegance with cheapness in an unusual degree. Great quantities of the native fabrics of the East are also imported into Europe. Some of these, from *excellence* in the material, and incomparable manual *dexterity* and patience in the workmen, though made with very simple machinery, equal in fineness and beauty anything of European manufacture. The natives are said to perform their finest work in moist cool places under ground, which makes the cotton hold together, so as to draw out to the thinnest threads; and the soft and *delicate* fingers of the Indian women give them sense of feeling to a degree of nicety much beyond that of Europeans. It is *probable* that cotton at present clothes more people in the world than any other substance. Its peculiar advantages, besides cheapness, is the union of warmth with lightness, whence it is fitted for a great variety of climates. To the hot it is better adapted than linen, on account of its *absorbing* quality, which keeps the skin dry and comfortable. The woolliness of cotton gives a kind of nap to the cloth made of it, which renders it soft to the touch, but apt to attract dust. In the fine muslins this is burned off by passing them between heated cylinders with such *velocity* as not to take fire, which considering the *combustility* of cotton, must be a very nice operation. AIKIN.

## LESSON XIII.

### THE MINERAL KINGDOM—STONES.

The mineral kingdom is the third and last grand division of all bodies in nature, comprehending under it every substance not included in the animal and vegetable kingdoms. It is generally divided into four classes, viz.—earths, salts, combustibles, and metals. Earthy minerals are destitute of taste and smell; as clay, stones, flint, sand, crystal, spar, gypsum, alabaster, chalk, and precious stones. *Saline* minerals have a *pungent* taste, as salt, nitre, alum, borax. Combustible or inflammable minerals are lighter than the earthy and *saline*, and never feel cold to the touch; as bitumen, sulphur, black lead, amber and coals. Metallic minerals are cold, malleable, and fusible, and some of them are distinguished by their weight; as platina, gold, silver, copper, iron, lead, &c.

Stones.—Stones are divided into two classes, earthy and *saline*. Of the former, diamond, quartz, crystal, flint, and several others, will scratch glass; clay, clay-slate, mica, and talc will not. Lime is a *saline* stone. The diamond, or adamant of the ancients, is the most valuable of gems, and the hardest of all known bodies. When pure, it is perfectly transparent; and though for the most part colourless, it is sometimes found yellow, green, blue, blackish, or rose-coloured. The best diamonds are brought from the East Indies, the principal mines being in the provinces of Golconda and Bengal. The first discovery of diamonds at Coulour, in the former province, was about two *centuries* ago, by a countryman, who, on digging his ground to sow millet, accidentally found one of these stones of a large size. From that period the whole of the *adjacent* plain began to be searched, to the depth of from ten to fourteen feet ; and the work was at one time so extensively pursued, that nearly 6000 persons were employed in it. Diamonds are likewise found in the island of Borneo, and in several parts of South America. The following is the *method* in which they are obtained from one of the rivers in Brazil :—The current is turned, and part of the bed of the river being laid dry, the mud is taken up and washed, by negroes, in places prepared for the purpose, through which a portion only of the stream is allowed to flow. As soon as all the earthy *particles* have been washed away, the gravel-like matter that remains is raked together, the stones are thrown out, and what diamonds happen to be present are found among the refuse that is left. Of all transparent substances, none can be compared with the diamond for brilliancy. Its hardness is such, that no steel instrument whatever can make any impression upon it. Notwithstanding this, at a temperature not so high as that which is required for the melting of silver, it gradually dissipates and burns. Diamonds have been shown to consist principally of carbon or charcoal in a pure and crystallized state. When rubbed they will attract bits of straw, feathers, hairs, and other small objects ; and if exposed to the rays of the sun, and immediately taken into a dark place, some diamonds will appear *luminous*. The principal use of the diamond is in jewellery. It is also used by *lapidaries*, for sliting hard stones, and for cutting and engraving upon other gems; by clock-makers in the finer kinds of clock-work, and by glaziers, for cutting their glass.

COMMON QUARTZ is a hard and foliated substance, usually of a white or grey colour and more or less transparent. It is generally found in shapeless masses, which are nearly thrice as heavy as water, and the *fracture* of which is glassy. When crystallized, it most commonly has the form of a six-sided prism, *terminated* by a *pyramid* of six sides. This kind of stone forms a constituent part of many mountains, and is very common in our own, as well as in most other countries. It is sufficiently hard to scratch iron and steel; and it has the property, after having been several times successively made red-hot, and dipped into water, of communicating to that fluid a certain degree of *acidity*. Quartz is employed, in place of sand, for making the finer kinds of glass; and also in the manufacture of porcelain. After having been burnt and reduced to powder, it is sometimes mixed with clay, and formed into bricks for the construction of glass furnaces: these are capable of resisting the intense heat which is requisite in the fusion of glass.

ROCK CRYSTAL is an extremely beautiful kind of quartz, sometimes perfectly transparent, and sometimes shaded with grey, yellow, green, brown, or red. It occurs in the form of crystals with six sides, each end *terminated* by a six-sided prism. The name of this substance was considered by the ancients to signify ice, or water crystallized; and they imagined that crystal was produced from a congelation of water. Its uses are numerous. It is cut into *vases, lustres,* and snuff-boxes ; and many kinds of toys of extremely beautiful appearance are made of it. When pure and perfectly transparent, it is in much request by *opticians,* who make of it those glasses for spectacles which are called pebbles, and who use it for various kinds of *optical* instruments. The best crystal is imported from Brazil and Madagascar, in blocks not unfrequently from fifty to a hundred pounds in weight.

Common Sand is a *granulated* kind of quartz ; or consists of rounded grains, of small size, which have a *vitreous* or glassy surface. It is usually of a white or yellowish colour ; but it is sometimes blue, violet, or black. In the *torrid* regions of Africa and Asia there are immense tracts of desert covered only with sand, so dry and light as to be moveable by the wind, and to be formed into vast hills and boundless plains. These are incessantly changing their places, and frequently overwhelm and destroy the travellers whose necessities require them to enter these dreary realms. Sand has numerous uses. When mixed in due proportion with lime, it forms that hard and valuable cement called mortar. Melted with soda or potash, it is formed into glass ; white sand being used for the finer kinds, and coarse and more impure sand for bottle glass. Sand is also employed in the manufacture of earthenware ; and its utility in various branches of domestic economy, but particularly for the scouring and cleaning of kitchen utensils, is well known. In agriculture, sand is used by way of manure for all clayey soils, as it renders the soil more loose and open than it would otherwise be. The best sand for this purpose is that which is washed by rains from roads or hills, or that which is taken from the beds of rivers. There is a kind of sand which is naturally mixed with clay, and has the name of founder's sand, from its being chiefly employed in the formation of moulds, to cast metals in.

FLINT is a peculiarly hard and compact kind of stone, generally of a smoke-grey colour passing into greyish, white, reddish, or brown. It is nearly thrice as heavy as water, and when broken will split, in every direction, into pieces which have smooth surfaces. It is very common in several parts of England, generally among chalk, arranged in a kind of strata, or beds, and in pieces that are, for the most part, either rounded or *tubercular*. The property which flint possesses of yielding sparks whch struck against steel, has rendered it an article of indispensable utility in the system of modern warfare. To this substance the sportsman is also indebted for a means of obtaining his game. Flint is employed in the manufacture of porcelain and glass. For this purpose it is heated red-hot, and in that state is thrown into cold water. It is then of a white colour and capable, without difficulty, of being reduced to powder, either in a mortal or by a mill. After this powder has been passed through fine sieves, some *aquafortis* is poured upon it, to dissolve any particles of iron which it may have acquired in the grinding. The powder is then several times washed in hot water, and afterwards dried for use. The glass that is manufactured from this substance is perfectly transparent and faultless.

Common Clay, which is found in nearly every country in the world, is sometimes white, has a blue or yellowish tinge or is brown or reddish. It is the peculiar *quality* of this substance to become so hard that it will even strike fire with steel. The ductility of clay, and its property of thus hardening in the fire, have rendered it an article of indispensable utility to mankind in all civilized countries. It is formed into eating vessels of almost every description; plates, dishes, cups, basins, bowls, and pans for keeping provisions in. For these almost any kind of clay may be advantageously used: but it is necessary to mix it with sand, for the purpose of rendering the vessels that are made of it more firm and strong. Those that are applied to *culinary*, and other uses, in which it is requisite for them not to be penetrable by water, are covered with a glazing. This glazing, for coarse ware, is sometimes made with lead, and sometimes by throwing a certain portion of salt into the furnace. In the formation of the better kinds of earthenware, the clay is made into a paste with water, moulded into the requisite shape upon a horizontal wheel, the inside being formed by one hand of the potter, and the outside by the other, as the wheel turns round. When the pieces have been baked, they are dipped into a glazing mixture, consisting of white lead, ground flints and water, and are exposed a second time to the fire. The different colours of earthenware are obtained by means of various kinds of metallic *oxides*. The coarser kinds of clay are manufactured into bricks for the building of houses, and tiles for the covering and flooring of them. These are formed in moulds of the requisite shape, afterwards dried for some time in the sun, and finally piled in kilns, and then baked to a proper degree of hardness. The earth for bricks ought to be sufficiently fine, free from pebbles, and not too sandy, which would only render them heavy and brittle ; nor ought it to be entirely free from sand, as this would make them crack in drying. Clay is a substance of inestimable value for forming the bottoms of ponds, and the bottoms and sides of canals and reservoirs, to prevent water from draining away. It also composes in a great measure, those tenacious earths called *arable* soils. What is peculiarly denominated clay land is known by its holding water, and not soon drying when wetted. Such land requires much labour from the husbandman before it can be sufficiently *pulverized,* or brought to a fit state for being productive of corn or grass.

CLAY-SLATE is a kind of stone of a foliated texture, and of a greyish, black, brown, green, or blueish colour. It breaks into splinters, does not adhere to the tongue, yields generally a clear sound when struck, and is nearly thrice as heavy as water. Vast and extensive beds of slate occur in different parts of the world : and this mineral sometimes constitutes even a principal portion of mountains. The uses of slate are numerous and important; but its principal use is for the roofing of houses. The kinds which are preferred for this purpose are such as have the smoothest surface, and split into the thinnest plates.

Dark- colored, compact, and solid slates are manufactured into writing slates. In the preparation of these, the slate after it is split of a proper thickness, is smoothed with an iron instrument. It is then ground with sandstone, slightly polished with tripoli, (a kind of clay,) and, lastly, rubbed with charcoal powder. Slate pencils are also made of a particular kind of slate, which, on splitting, falls into long splintery *fragments*. As it becomes very brittle when exposed to the action of the sun or frost, the workmen are very careful to cover it up and sprinkle it with water as soon as it is taken from the quarry, and to preserve it in damp cellars. The pieces are afterwards split by an instrument for the purpose, and then wrought into the requisite shape. In some of the quarries in Derbyshire and Wales, the slate is so thick as to admit of being split into large tabular pieces. These are used for gravestones, and for slabs for dairies and cellars: pavingstones and mile stones are also formed of them. When sufficiently solid for the purpose, slate is cut into inkstands, and turned into *vases*, and fancy articles of various kinds. When pounded it is advantageously used for cleaning iron and other works in metal.

COMMON MICA is a mineral substance of foliated texture, which is capable of being divided into extremely thin leaves that have a sensible elasticity, and are transparent. The colour of mica is greenish, sometimes nearly black, reddish, brown, yellow, or silvery white, with occasionally a metallic lustre on the surface. Mica is so soft as easily to be scratched; and when divided across the plates, seems rather to tear than to break. It is one of the most abundant mineral substances that is known. It not only occurs in a massive and crystallized state, but it enters into the composition of many rocks; and is found filling up their fissures, or crystallized in the cavities of the veins which traverse them. In some countries, as in Siberia, it is an article of commerce, and is obtained from mines like other minerals. From these it is extracted by hammers and chisels. It is then washed to free it from the impurities which adhere to it; split into thin leaves or pieces; and *assorted* into different kinds, according to their goodness, purity and size. Thin plates of mica are used in many parts of Siberia and Muscovy, and also in Peru, Mexico, and Pennsylvania, to supply the place of glass for windows. In the shipping of Russia it is considered preferable to glass, as the *concussion* produced by the firing of the guns does not shatter it. It may be advantageously substituted for horn in lanterns, as it is not only more transparent, but is not susceptible of injury from the flame of a candle. It has, however, the inconvenience of soon becoming dirty, and of having its transparency destroyed by long exposure to the air. So plentiful is this substance in Bengal, that for the value of five shillings as much of it may be purchased as will yield a dozen panes, each measuring about twelve inches in length and nine in breadth, and so clear as to allow of ordinary objects being seen through them at the distance of twenty or thirty yards.

Asbestos (a species of talc) is a greenish or silvery white mineral of a fibrous texture, which is found in many mountainous countries. Its name is derived from the Greek language, and signifies that which is inconsumable. This mineral, and particularly a silky variety of it, in long slender *filaments*, called amianthus, was well known to the ancients. They made it into an incombustible kind of cloth in which they burned the bodies of their dead, and by which means they were enabled to collect and preserve the ashes without mixture. In the manufacture of this article they were not able to weave the asbestos alone, but in the loom were obliged to join with it linen or woollen threads, which were afterwards burned away. Cloth made of amianthus, when greased or otherwise contaminated with dirt, may be cleansed by throwing it into a bright fire. In this process the stains are burned out, and the cloth is restored to a dazzling white colour. Pliny, the Roman naturalist, informs us that he himself had seen tablecloths, towels, and napkins of amianthus taken from the table of a great feast, thrown into the fire and burned before the company; and by this operation, he says, they became better cleansed than if they had been washed. The inhabitants of some parts of Siberia manufacture gloves, caps, and purses of amianthus; and in the Pyrenees it is wrought into girdles, ribbons and other articles. The finest girdles are made by weaving the most beautiful and silky *filaments* with silver wire. The shorter fibres of amianthus have sometimes been manufactured into paper; but it is too hard for use, and, at any rate, would be of little service for preserving valuable documents unless we at the same time possessed fire-proof ink.

LIME, after it has been freed from extraneous matter by burning, is a mineral of a whitish colour and of a *pungent*, acrid, and caustic taste. It has the property of changing vegetable blue colours into green, and of corroding and destroying animal substances. The process of purifying lime is by burning it in a large kind of furnace, called a *kiln*, where the lime stone and fuel are heaped in alternate layers. After it has undergone this process it is called *quicklime*. The uses of this mineral are numerous and important. The principal of these is in the formation of mortar or cement for buildings. For this purpose it is first slaked by having water poured upon it; a violent heat is thereby excited, and the lime falls into powder; it is then formed into a kind of paste by working it with water and sand. Lime is also used in agriculture as a manure. It is employed in the refining of sugar, in the manufacture of soap, and by tanners, in a state of solution, for dissolving the gelatinous parts of skins, and removing the hair from them. The manufacturers of glue mix it with that article, for the purpose of adding to its strength, and preventing its becoming flexible by the absorption of moisture. Lime if swallowed or inhaled, is a virulent poison: notwithstanding which, it is of considerable use in medicine.

MARBLE is a compact and close-grained kind of limestone so hard as to admit of being polished. It is this *quality* which distinguishes it from other *calcareous* substances. The principal use of marble is for ornamental *architecture* and *sculpture;* yet nearly all the numerous kinds of it may be burned, and thus converted into quicklime. It was assigned as one of the reasons for the removal of what are commonly called the Elgin Marbles from Athens to London, that the Turks were rapidly destroying them for that purpose. Marble has been known from a very early period. The book of Esther, in the Old Testament, describes the palace of Ahasuerus to have had "pillars of marble," and the pavement to have been of "red, and blue, and white, and black marble."

Calcareous Alabaster is another species of limestone deserving of notice on account of its formation. The water which oozes through the crevices of limestone rocks becomes strongly impregnated with minute particles of lime. This water, when it has reached the roof or side of a cavern, is generally suspended for a considerable time before a drop of sufficient size to fall by its own weight is formed. In the *interval* which thus *elapses*, some of the particles of lime are separated from the water and adhere to the roof. In this manner successive particles are attached to each other, until what is called a *stalactite*, having somewhat the appearance of an icicle, is formed. If the water collects and drops too *rapidly* to allow time for the formation of a stalactite, it falls upon the floor and there forms an irregular lump of alabaster, which has the name of *stalagmite*. In some caverns the separation of the *calcareous* matter takes place both at the roof and on the floor: and, in course of time, the substance upon each *increasing*, they meet and form pillars, sometimes of great *magnitude*. The kind of limestone formed in this manner is what the ancients generally denominated *alabaster*. It was employed by them for the same purposes as marble, being cut into tables, columns, vases, and even statues. They also used it in the manufacture of boxes for containing unguents. It is supposed to have been a vessel formed of this stone that is mentioned in the Gospel of St. Matthew, where it is said that there came unto our Saviour " a woman having an alabaster box of precious ointment."

## LESSON XIV.

### SALTS—COMBUSTIBLES.

SODA.—The soda of commerce is obtained from sea-water, and from the ashes of different kinds of plants that grow on the sea-shore, particularly from that called *salsoda* which is found in great abundance on the coasts of the southern parts of Europe, and from which it has its name. It is sometimes called *barilla*, from the salsoda being so denominated in Spain. This substance is of *essential* use in the arts. When melted with flint or sand, it forms glass, and answers much better for this purpose than potash. In *conjunction* with oil and lime, it is employed in the manufacture of soap; and it is used as a substitute for it in the cleaning and bleaching of linen, flannels, and worsted goods. If a weak solution of soda be poured into foul bottles, or casks in which wine has been long kept, it will cleanse them. It may also be successfully used for washing vessels in which milk has become acid. Saddles, bridles, and boot-tops may be effectually cleaned by means of this liquor, and restored to nearly their original color and appearance.

COMMON SALT, though found in some countries in a solid and massive state, is for the most part an artificial preparation from sea-water, or from the water of salt lakes and brine springs. Scarcely any other production is in so much request. It is used by the inhabitants of nearly all countries for correcting the *insipidity* of food. When applied in small quantities, it *accelerates* the putrid fermentation; and, in this case, is considered to aid digestion, by promoting the decomposition of the *aliments*. In larger quantities, it has a contrary effect, and tends to preserve organic substances from corruption. Salt is used for glazing the surface of coarse earthenware: and is employed in several processes of dyeing. When this substance is dug out of the earth, it has the appellation of *rock salt*; and immense masses of it are found in different countries of the world. The most considerable, as well as the most celebrated salt mines, with which we are acquainted, are those about five miles from Cracow, in Poland. On descending to the bottom of these mines, a stranger is astonished to find a kind of subterranean *republic*, consisting of many families, who have their own peculiar laws and *polity*. Here are public roads, and carriages; horses being employed to draw the salt to the mouths of the mine, where it is taken up by engines. Many of the people are born there, and never stir out; but others have occasional opportunities of breathing the fresh air in the fields, and enjoying the light of the sun. The subterraneous passages or galleries are very *spacious*; and, in many of them, chapels are hewn out of the salt. In the year 1780, the greatest depth to which the workmen had penetrated was about 320 yards, and the mass of salt was considered to be in some places more than 240 yards thick, and to extend at least three leagues.

NITRE is usually observed in the form of fine *capillary* crystals, though it is sometimes found in a massive state. In some parts of India, Africa, and Spain, it is found incrusted on the surface of the earth, and in such abundance as to admit of being swept off, at certain seasons of the year, twice or three times a week. Immense quantities of nitre are annually required for the purposes of war. From its constituting one of the most important substance in the composition of gunpowder, it has been found necessary to adopt artificial modes of producing it. In several parts of the East Indies there are places called *saltpetre* grounds. From these, large *quantities* of the earth are dug, and put into cavities through which water is made to pass. This brings away with it the salt which the earth contains; and which is afterwards separated from the water by boiling. The discovery of gunpowder has completely changed the modern art of war. The earliest notice of the use of this article in Europe is about the year 1373, when it was employed in the wars of Germany. It is said, however, to have been known in China long anterior to that period. Its component parts are nitre, charcoal, and sulphur in the proportion of seventy-six, fifteen, and nine parts in every hundred. These ingredients are first reduced to a fine powder separately, and then mixed with water so as to form a thick paste. After this has dried a little it is placed upon a kind of sieve full of small holes, through which it is forced. By this process it is divided into grains, the size of which depends of course upon the width of the holes through which it has been squeezed. It afterwards undergoes some other operations before it is ready for use. Nitre is frequently administered in medicine: and it is used very extensively in different arts.

COMMON or PIT COAL is usually composed of charcoal and bitumen, with a small portion of clay. It is generally of a slaty structure and foliated texture; and when burnt, cakes more or less during combustion. Some foreign writers have ascribed the great wealth of Great-Britain to the coals which are produced in many parts of the island in such abundance, and which facilitate, in a very *essential* degree, nearly all its manufactures, and consequently are a means of promoting its commerce to an extent which is possessed by few other countries. All the great manufacturing towns, Birmingham, Sheffeld, Leeds, Glasgow, &c. are situated either in the midst of coal districts, or in places to which coals can be conveyed with little expense. In England coals are principally obtained from the neighborhood of Newcastle-upon-Tyne, Sunderland, and Whitehaven. At Newcastle there is a coal-pit nearly 800 feet in depth, and which is wrought horizontally, quite across and beneath the bed of the river Tyne, and under the adjacent part of the county of Durham. At Whitehaven the mines are of great depth, and are extended even under the sea, to places where there is above them sufficient depth of water for ships of great burthen, and in which the miners are sometimes able to hear the roaring of the waves. On the contrary, in some parts of Durham the coal lies so near the surface of the earth that the wheels of carriages lay it open in such *quantities* as to be sufficient for the use of the neighborhood. In general the entrance to coal mines is by perpendicular shafts, and the workmen and coals are drawn up by *machinery*. As the mines frequently extend to great distances horizontally beneath the surface of the earth, peculiar care is necessary to keep them continually *ventilated* with currents of fresh air, for the purpose of affording to the workmen a constant supply of that vital fluid, and also of expelling from the mines certain noxious *exhalations* which are sometimes produced in them. One of these, denominated fire-damp, *explodes* with great violence on the approach of a lighted candle or any other flame, and has, at different times, occasioned the loss of many valuable lives. It is a singular circumstance, that although it is set on fire by a flame, yet it cannot be kindled by a red-hot iron, nor by sparks produced from the *collision* of flint and steel. Hence a *machine*, called a steel mill, was contrived, to produce, by *collision* with flints, a sufficient light for the miners to carry on their work in places where the flame of a candle would produce *explosion*. But the safety-lamp invented by the late Sir Humphrey Davy has nearly, if not entirely, superseded the steel mill. This lamp is inclosed in a wire gauze *cylinder*, the interstices of which are so extremely small, that, while it permits the light to escape, it prevents the surrounding gas from communicating with the lamp so as to *explode*. Another injurious *exhalation* in coal mines is called choke-damp. It is the property of inflammable air to rise to the upper parts: but this, on account of its weight, occupies principally the lower parts of the mines, and occasions death by *suffocation*, though it is by no means so *fatal* as the former. The uses of coal as fuel are too well known to need any observations. By *distilling* it, an *inflammable* gas is produced, which of late has been introduced for the lighting of manufactories, and the principal streets and shops of almost all the large towns in the empire. This gas is conveyed by pipes from the reservoir in which it is collected to great distances;

and the light which it yields is peculiarly brilliant and beautiful. It was at the foundry belonging to Messrs. Boulton and Watt, at Birmingham, that the first display of gas lights was made, in the year 1802, on the occasion of the rejoicings for peace.

AMBER is a substance usually of a golden yellow color, *semi-transparent*, and of a shining and somewhat *resinous* lustre. The origin of it is unknown; but, from the ants and other insects which it frequently contains, there can be no doubt that it has once been in a fluid state. The ancients, among whom it was in great request, called it *electron*. Amber is usually found in rounded and detached pieces, on the south coast of the Baltic, on the eastern shores of England, and in small *quantities*, on those of Sicily and the Adriatic; and a substance greatly resembling it is occasionally found in gravel-pits near London The only mines of amber at present known are in Prussia. These are worked in the usual way, by shafts and galleries, to the depth of 100 feet. The amber is imbedded in a stratum of *fossil* wood, and occurs in rounded pieces from a few grains to three and five pounds in weight. Before the discovery or general dispersion of precious stones from India, amber was considered of great value as a jewel, and was employed in all kinds of ornamental dresses. It is now chiefly in request among Greek and Armenian merchants, but it is uncertain where they dispose of it. Some persons conjecture that it is purchased by pilgrims previously to their journey to Mecca; and that, on their arrival in that place, they burn it in honor of Mahomet.

## LESSON XV.

### METALS.

PLATINA is the most ponderous of all the metals, and when *purified* is more than twenty-one times heavier than water. It is also one of the hardest and most difficult to be melted, the most intense fire and most powerful acids having scarcely any effect upon it. It is not fusible by the heat of a forge, but requires either the *concentrated* rays of the sun in a burning mirror, the galvanic electricity, or a flame produced by the agency of *oxygen* gas. It is of a white color, but darker than silver, and is generally found in small blunted and *angular* grains or *scales* in the sands of some of the rivers in South America. It has also been found in Russia. This metal was unknown in Europe till the year 1741. Its ductility is so great that it may be rolled into plates, or drawn into wire. Platina is also made into mirrors for reflecting *telescopes*, into *mathematical* instruments, pendulums, and clock-work; particularly where it is requisite that the construction of these should be more than usually correct, as platina is not only free from liability to rust, but is likewise subject to very little *dilation* by heat.

GOLD is a metal distinguished by its yellow colour, by its being softer than silver, but considerably harder than tin. It is found in various states, massive, in grains, small *scales*, and capillary, or in small branches. It cannot be dissolved in any acid except aqua regia, and is more than nineteen times heavier than water. Gold abounds in many of the African rivers, and is very common in several districts both of South America and India. The principal gold mines in Europe are those of Hungary. Gold has been found in Norway and Sweden, and in various parts of England, Ireland, and Scotland. The mode of extracting the gold from its ore is by reducing it to a fine powder, and mixing this powder with quicksilver. The quicksilver having the quality of uniting with itself every particle of the precious metal, but being incapable of union with the other substances, extracts it even from the largest portion of earth. The quicksilver is then driven off by means of heat. Coinage, or sterling gold, consists of an alloy of about twenty-two parts of gold with two parts of copper: whilst gold of the new standard, of which gold plate, watch-cases, and many articles are made, consists of only eighteen parts of gold, and six parts of copper. The coinage gold of Portugal and America is of the same standard as our own; that of France is somewhat inferior: and Spanish gold is inferior to the French. The Dutch ducats and some of the Moorish coins are of gold unalloyed.

Silver is a white, brilliant, *sonorous*, and ductile metal, somewhat more than ten times heavier than water. It melts at a bright red heat. It is found in different states. Of these the principal is denominated native silver, from its being nearly in a state of *purity*. Native silver sometimes occurs in small lumps, sometimes in a crystallized form, and sometimes in leaves, threads, or wire. In many instances the latter are so *connected* with each other as to resemble the branches of trees, in which case the ore is called *dendritic*. There are also several ores of silver in which this metal is combined with lead, antimony, *arsenic*, sulphur, and other substances. Like gold, silver is coined into money, and is manufactured into various kinds of utensils, which have the general appellation of silver plate. For these purposes it is alloyed with copper, which does not affect its whiteness. Our standard silver is composed of about twelve and a quarter parts of pure metal and one part of copper; and the metal of this standard is used both for silver plate and in the coinage.

MERCURY in its native state is called quicksilver, and is found in small globules of a shining, silvery appearance scattered through different kinds of stones, clay, and ores. It is nearly fourteen times heavier than water. The principal ore of mercury, and that from which the metal is chiefly obtained, is cinnabar. This is of a red colour, and consists of mercury mineralized with sulphur. This metal is always fluid at the common temperature of the atmosphere: by extreme cold it becomes solid, and in this state may be beaten with a hammer and extended without breaking. Being the heaviest of all fluids of which we have any knowledge and not congealing at the temperature of our climate, it has been preferred to all others for *barometers*, as a measure for the weight of the atmosphere. And as heat *dilates* mercury similarly to other fluids, it is likewise made into *thermometers*. The combinations of mercury with other metals are termed amalgams. Mercury and tin combined form the substance that is used for the silvering of looking glasses. There are several preparations of mercury used in medicine. A valuable red color called vermillion is formed by melting together three parts of mercury and one of sulphur.

Copper is a red or orangecoloured metal, about nine times heavier than water. It is the most *sonorous* of all the metals, and, except iron, the most elastic. It melts at a cherry red or dull white heat. It is found under a great variety of forms, sometimes in masses of pure metal; but more frequently in combination with other substances, particularly sulphur. The uses of copper are numerous and important. When rolled into sheets betwixt large iron cylinders, it is employed for the covering of houses, sheathing the bottoms of ships, and for engraving upon, &c. As copper does does not, like iron, strike fire by collision, it has been substituted for iron in the machinery which is employed in gunpowder mills. Several preparations of copper are used in medicine, both externally and internally. Verdigris is a rust or oxide of copper, usually prepared from that metal by *corroding* it with vinegar. Of all metals that are known, copper is the most susceptible of alloy. Brass, prince's metal, or pinchbeck, and Dutch gold or Dutch metal are all alloys of copper and zinc. Bronze, the metal of which cannons are made, and bell metal, are alloys of copper and tin. White copper is an alloy of equal parts of copper and arsenic.

Iron is a metal of a livid greyish colour, hard and elastic, and capable of receiving a high polish. Its weight is nearly eight times that of water. It is seldom found in a truly native state, but occurs abundantly in almost every country of the world, in a state of oxide, and mineralized with sulphuric, *carbonic*, and other acids. Iron is found in plants, in several kinds of colored stones and even in the blood of animals. With us iron is employed in three states, namely, cast iron, wrought iron, and steel. Cast iron is so hard as to resist both the hammer and the file; extremely brittle, and of a dark grey colour. The process of converting cast iron into wrought or malleable iron, is called blooming. The cast iron is thrown into a furnace, and kept melted by the flame of combustibles which is made to play upon its surface. Here it is suffered to continue about two hours, a workman constantly stirring it, until, notwithstanding the continuance of the heat, it gradually acquires consistency, and congeals. It is then taken out while hot, and violently beaten with a large hammer worked by machinery. In this state it is wrought into bars for sale. Steel is usually made by a process called cementation. This consists in keeping bars of iron in *contact* with powder charcoal, during a state of *ignition* for several hours, in earthen troughs or *crucibles*, the mouths of which are stopped up with clay. Steel, if heated to redness, and suffered to cool slowly, becomes soft; but if plunged, whilst hot, into cold water, it acquires extreme hardness. The iron procured from Sweden is esteemed the best for the manufacture of steel.

TIN is a white metal, somewhat like silver in appearance, but is considerably lighter, and makes a crackling noise when bent. It is very soft and ductile, and has but little elasticity. This metal is always found either in a state of oxide or in combination with sulphur and copper, and is about seven times as heavy as water. It melts at 440°. Tin is an essential ingredient in bell metal, bronze, pewter, and various other compounds.

Lead is a heavier metal than tin, of a pale and livid grey colour when broken, not *sonorous* when pure, very flexible, and so soft that it may be marked with the nail. It stains paper or the fingers of a bluish colour, and is about eleven times heavier than water. It melts at 600°. The most common state in which lead is found is in combination with sulphur and a small portion of silver. This ore is known by the name of galena, and is frequently in the form of blackish cubical crystals. Lead is also found in union with *arsenic* and many acids. Great quantities of lead are used for the making of shot. For this purpose it is alloyed with arsenic, to render it more brittle, and to render the grains more round and perfect than they would otherwise be. An alloy of lead and tin forms the solder which is used by plumbers. The types that are used by printers for very large characters, are sometimes composed of an alloy of lead and copper. Lead is also used with tin in the manufacture of pewter.

Zinc, or Spelter, as it is sometimes called, is a bluish white metal. It has a very perceptible taste, is about seven times heavier than water, rather harder than silver, and possesses but a small degree of malleability and ductility, except under certain circumstances. It melts at about 680°. This metal is never found in a pure state; and the principal ores from which it is procured are known by the names of calamine and blende. In China, zinc is used as a current coin of the country. It is employed in the manufacture of brass, pinchbeck, and bronze, all of which consist of this metal in combination with different proportions of copper.

ARSENIC is a metal of a steel-blue colour and considerable brilliancy; it is remarkably brittle, and somewhat more than eight times heavier than water. This metal, and all its compounds are *virulent poisons*. Its vapor has a very strong smell resembling garlic. It is found nearly pure in different parts of Germany. The arsenic sold in the shops is an oxide or rather an acid of this metal artificially prepared. The manufacturers of glass frequently employ the oxides of arsenic in fabrication of that article. Arsenic is used in the processes of dying and calico printing, and for the imparting of different artificial shades and colour to furs. It is also used in the manufacture of small shot. In medicine it is occasionally used, though in extremely small doses.

ANTIMONY is a metal of a brilliant and slightly bluish white colour destitute of ductility, and about seven times heavier than water. It is as hard as silver, and so brittle that it may easily be reduced to powder in a mortar. This metal is the *basis* of several medicinal preparations.

## LESSON XVI.

### FLYING FOWL, AND CREEPING THINGS, PRAISE YE THE LORD.—Psalm cxlviii. verse 10.

Sweet flocks, whose soft enamel'd wing
Swift and gently cleaves the sky ;
Whose charming notes address the spring
With an artless harmony ;
Lovely minstrels of the field,
Who in leafy shadows sit,
And your wondrous structures build,
Awake your tuneful voices with the dawning light
To Nature's God your first devotions pay
Ere you salute the rising day ;
'Tis he calls up the sun, and gives him every ray.
Serpents who o'er the meadows glide,
And wear upon your shady back
Numerous ranks of gaudy pride,
Which thousand mingling colours make ;
Let the fierce glances of your eyes
Rebate their baleful fire :
In harmless play twist and unfold
The volumes of your scaly gold ;
That rich embroidery of your gay attire,
Proclaims your Maker kind and wise.
Insects and mites, of mean degree,
That swarm in myriads o'er the land,
Moulded by Wisdom's artful hand
And curl'd and painted with a various dye ;
In your innumerable forms,

Prasie him that wears th' ethereal crown,
And bends his lofty counsels down
To despicable worms.

WATTS.

## LESSON XVII.

### GOD THE AUTHOR OF NATURE.

——— There lives and works
A soul in all things, and that soul is God.
The beauties of the wilderness are his,
That make so gay the solitary place
Where no eye sees them. And the fairer forms
That cultivation glories in are his.
He sets the bright procession on its way,
And marshals all the order of the year;
He marks the bounds which winter may not pass,
And blunts his pointed fury; in its case,
Russet and rude, folds up the tender germ,
Uninjured, with inimitable art;
And, ere one flowery season fades and dies,
Designs the blooming wonders of the next.
The Lord of all, himself through all diffused,
Sustains and is the life of all that lives.
Nature is but a name for an effect,
Whose cause is God. One spirit—His
Who wore the plaited thorns with bleeding brows,
Rules universal Nature! Not a flower
But shows some touch, in freckle, streak, or stain,

Of his unrivalled pencil. He inspires
Their balmy odors, and imparts their hues,
And bathes their eyes with nectar, and includes,
In grains as countless as the sea-side sands,
The forms with which he sprinkles all the earth.
Happy who walks with him! whom, what he finds,
Of flavor, or of scent, in fruit or flower,
Or what he views of beautiful or grand
In Nature, from the broad majestic oak
To the green blade that twinkles in the sun,
Prompts with remembrance of a present God!

COWPER.

## LESSON XVIII.

### ALL CREATURES CALLED ON TO PRAISE GOD.

Begin, my soul, th' exalted lay!
Let each enraptured thought obey,
  And praise the Almighty's name:
Lo! Heaven and earth, and seas and skies,
In one melodious concert rise,
  To swell th' inspiring theme.

Join, ye loud spheres, the vocal choir
Thou dazzling orb of liquid fire,
  The mighty chorus aid:
Soon as grey ev'ning gilds the plain,
Thou, moon, protract the melting strain,
  And praise him in the shade.

Let every element rejoice :
Ye thunders, burst with awful voice
To him who bids you roll ;
His praise in softer notes declare,
Each whispering breeze of yielding air,
And breathe it to the soul.

To him ye graceful cedars bow ;
Ye tow'ring mountains, bending low,
Your great Creator own ;
Tell, when affrighted nature shook,
How Sinai kindled at his look,
And trembled at his frown.

Ye flocks that haunt the humble vale,
Ye insects flutt'ring on the gale,
In mutual concourse rise ;
Crop the gay rose's vermeil bloom,
And waft its spoils, a sweet perfume,
In incense to the skies.

Wake all ye mounting tribes, and sing ;
Ye plumy warblers of the spring,
Harmonious anthems raise
To him who shaped your finer mould,
Who tipp'd your glitt'ring wings with gold,
And tuned your voice to praise.

Let man, by nobler passions sway'd,
The feeling heart, the judging head,
In heavenly praise employ ;
Spread his tremendous name around,
Till heav'n's broad arch rings back the sound,
The gen'ral burst of joy.

Ye whom the charms of grandeur please,
Nursed on the downy lap of ease,
Fall prostrate at his throne;
Ye princes, rulers, all adore:
Praise him ye kings, who makes your pow'r
An image of his own.

Ye fair, by nature form'd to move,
O praise th' eternal source of love,
With youth's enlivening fire:
Let age take up the tuneful lay,
Sigh his bless'd name—then soar away,
And ask an angel's lyre.

OGILVIE.

## LESSON XIX.

### ON CRUELTY TO ANIMALS.

I would not enter on my list of friends
(Tho' graced with polish'd manners and fine sense,
Yet wanting sensibility) the man
Who needlessly sets foot upon a worm.
An inadvertent step may crush the snail
That crawls at evening in the public path
But he that has humanity, forewarn'd,
Will step aside, and let the reptile live.
The creeping vermin, loathsome to the sight,
And charged with venom, that intrudes,
A visitor unwelcome, into scenes,

Sacred to neatness and repose, the bower,
The chamber, or the hall, may die:
A necessary act incurs no blame.
Not so, when held within their proper bounds,
And guiltless of offence they range the air,
Or take their pastime in the spacious field:
There they are privileged. And he that hurts
Or harms them there is guilty of a wrong;
Disturbs th' economy of Nature's realm,
Who when she form'd design'd them an abode.
The sum is this: if man's convenience, health,
Or safety interfere, his rights and claims
Are paramount, and must extinguish theirs.
Else they are all—the meanest things that are,
As free to live, and to enjoy that life,
As God was free to form them at the first,
Who in his sovereign wisdom made them all.
Ye, therefore, who love mercy, teach your sons
To love it too. The spring time of our years
Is so dishonour'd and defiled, in most,
By budding ills, that ask a prudent hand
To check them. But alas! none sooner shoots,
If unrestrain'd, into luxuriant growth,
Than cruelty, most dev'lish of them all.
Mercy to him that shows it, is the rule
And righteous limitation of its act,
By which heav'n moves, in pard'ning guilty man,
And he that shows none, being ripe in years,
And conscious of the outrage he commits,
Shall seek it—and not find it in return.

COWPER.

## LESSON XX.

### DETACHED PIECES.

O how canst thou renounce the boundless store
  Of charms which Nature to her votaries yields?
The warbling woodland, the resounding shore,
  The pomp of groves and garniture of fields;
All that the genial ray of morning gilds,
  And all that echoes to the song of even:
All that the mountain's sheltering bosom shields,
  And all the dread magnificence of heaven,
O how canst thou renounce, and hope to be forgiven?

BEATTIE.

———————It wins my admiration
To view the structure of that little work—
A bird's nest. Mark it well within, without:
No tool had he that wrought; no knife to cut;
No nail to fix; no bodkin to insert:
No glue to join; his little beak was all;
And yet how nicely finish'd. What nice hand,
With every implement and means of art,
And twenty years' apprenticeship to boot,
Could make me such another?

HURDIS.

The sounds and seas, each creek and bay,
With fry innumerable swarm, and shoals
Of fish, that with their fins and shining scales,
Glide under the green wave, in sculls that oft

Bank the mid sea: part single, or with mate,
Graze the sea weed, their pasture; and thro' groves
Of coral stray, or sporting with quick glance
Show to the sun their waved coats dropt with gold,
Or, in their pearly shells at ease, attend
Moist nourishment, or under rocks their food
In jointed armour watch; part, huge of bulk,
Wallowing unwieldy, enormous in their gait,
Tempest the ocean.

MILTON.

## LESSON XXI.

### A POET'S NOBLEST THEME.

The works of man may yield delight,
And justly merit praise;
But though a while they charm the sight,
That charm in time decays;
The sculptor's, painter's, poet's skill
The art of mind's creative will,
  In various modes may teem;
But none of these, however rare,
Or exquisite, can truth declare
  A poet's noblest theme.

The sun uprising, may display
  His glory to the eye,
And hold in majesty his way
  Across the vaulted sky;

Then sink resplendent in the west,
Where parting clouds his rays invest
With beauty's softest beam:
Yet not unto the sun belong
The charms which consecrate in song
A poet's noblest theme.

The moon, with yet more touching grace,
The silent night may cheer,
And shed o'er many a lonely place
A charm to feeling dear;
The countless stars which grace her reign,
A voiceless, but a lovely train,
With brilliant light may gleam:
But she, nor they, though fair to see,
And form'd to love, can ever be
A poet's noblest theme.

The winds, whose music to the ear
With that of art may vie;
Now loud, awakening awe and fear,
Then soft as pity's sigh;—
The mighty ocean's ample breast,
Calm or convulsed, in wrath or rest,
A glorious sight may seem:—
But neither winds, nor boundless sea,
Though beautiful or grand, can be
A poet's noblest theme.

The earth, our own dear native earth!
Has charms all hearts may own;
They cling around us from our birth,—
More loved as longer known;

Her's are the lovely vales, the wild
And pathless forests, mountains piled
On high, and many a stream,
Whose beauteous banks the heart may love,
Yet none of these can truth approve
A poet's noblest theme.

The virtues which our fallen estate
With foolish pride would claim,
May, in themselves, be good and great,—
To us an empty name.
Truth, justice, mercy, patience, love,
May seem with man on earth to rove,
And yet may *only seem;*
To none of these, *as man's*, dare I
The title of my verse apply—
A poet's noblest theme.

To God alone, whose power divine
Created all that live;
To God alone can truth assign
This proud prerogative:
But how shall man attempt his praise,
Or dare to sing in mortal lays
OMNIPOTENCE SUPREME!
When seraph-choirs, in heaven above,
Proclaim his glory and his love
Their noblest, sweetest theme?

Thanks be to God! his grace has shown
How sinful man on earth
May join the songs which round his throne
Give endless praises birth.

He gave HIS Son for man to die
He sent HIS SPIRIT from on high
To consummate the scheme:
O be that consummation blest!
And let REDEMPTION be confest
A poet's noblest theme.

BARTON.

## LESSON XXII.

### OMNIPRESENCE OF GOD.

Above—below—where'er I gaze,
Thy guiding finger, Lord, I view,
Traced in the midnight planet's blaze,
Or glistening in the morning dew:
Whate'er is beautiful or fair,
Is but thine own reflection there.

I hear thee in the stormy wind,
That turns the ocean wave to foam;
Nor less thy wondrous power I find,
When summer airs around me roam;
The tempest and the calm declare
Thyself, for thou art everywhere.

I find thee in the depth of night,
And read thy name in every star
That drinks its splendor from the light
That flows from mercy's beaming car;
Thy footstool, Lord, each starry gem
Composes—not thy diadem.

And when the radiant orb of light
Hath tipp'd the mountain tops with gold,
Smote with the blaze my weary sight
Shrinks from the wonders I behold;
That ray of glory, bright and fair,
Is but thy living shadow there.

Thine is the silent noon of night,
The twilight eve—the dewy morn;
Whate'er is beautiful and bright,
Thine hands have fashion'd to adorn.
Thy glory walks in every sphere,
And all things whisper "God is here!"

ANON.

## LESSON XXIII.

### HOPE BEYOND THE GRAVE.

'Tis night, and the landscape is lovely no more;
I mourn—but, ye woodlands, I mourn not for you;
For morn is approaching, your charms to restore,
Perfumed with fresh fragrance, and glittering with dew.
Nor yet for the ravage of winter I mourn;
Kind nature the embryo blossom will save
But when shall spring visit the mouldering urn?
O when shall it dawn on the night of the grave?

'Twas thus, by the glare of false science betray'd,
That leads to bewilder, and dazzles to blind,
My thoughts wont to roam, from shade onward to shade,
Destruction before me, and sorrow behind.
"O pity, great Father of light," then I cried,
"Thy creature, who fain would not wander from thee!
Lo, humbled in dust, I relinquish my pride;
From doubt and from darkness thou only canst free."

And darkness and doubt are now flying away,
No longer I roam in conjecture forlorn:
So breaks on the traveller, faint and astray,
The bright and the balmy effulgence of morn.
See Truth, Love, and Mercy, in triumph descending,
And nature all glowing in Eden's first bloom!
On the cold cheek of Death smiles and roses are blending,
And beauty immortal awakes from the tomb!

BEATTIE.

### THE HEAVENLY REST.

There is an hour of peaceful rest,
To mourning wanderers given;
There is a tear for souls distrest,
A balm for every wounded breast—
'Tis found above—in heaven!

There is a soft, a downy bed,
'Tis sweet as breath of even:
A couch for weary mortals spread,
Where they may rest the aching head,
And find repose in heaven!

There is a home for weary souls,
By sin and sorrow driven;
When tost on life's tempestuous shoals,
Where storms arise, and ocean rolls,
And all is drear—but heaven!

There faith lifts up the tearful eye,
The heart with anguish riven;
And views the tempest passing by,
The evening shadows quickly fly,
And all serene in heaven!

The fragrant flowers immortal bloom,
And joys supreme are given;
There rays divine disperse the gloom.
Beyond the confines of the tomb
Appears the dawn of heaven!

ANON.

# SECTION II.

## LESSON I.

### NOTES ON EUROPE.

The **British Empire** consists of the United Kingdom of great Britain and Ireland, with extensive colonies in America, the East and West Indies, and Africa. The government is a mixed or limited monarchy, the legislative power being vested in the King and the two Houses of Parliament, and the executive in the King alone. Episcopacy is the established religion in England and Ireland, and Presbytery in Scotland; but a great proportion of the inhabitants of Ireland are Roman Catholics. The commerce and manufactures of the United Kingdom exceed those of any other country in ancient or modern times. Trade is carried on with every part of the world, particularly with the East and West Indies, and the United States of America. Some of the principal manufactures are those of cotton goods, the centre of which is Manchester; of woollens, the centre of which is Leeds; of hardware, the chief seats of which are Birmingham and Sheffield; and of pottery, which is principally established in Staffordshire. The tin mines of Cornwall give employment to 100,000 men; and many are employed in various parts of England, Ireland, and Scotland, in collieries, and in iron, lead, and other mines.

**France** has always been one of the most powerful states of modern Europe. At one time it possessed numerous colonies in different parts of the world; but most of them have been lost in the wars with Great Britain. Since the year 1814, the government has been a limited monarchy. The great majority of the people are of the Roman Catholic religion; but all other sects are tolerated, and all Frenchmen are equally admissible to civil and military employments. The chief manufactures of France are woollens, silks, laces, hardware, cotton, goods, and porcelain. It produces different kinds of grain, and excellent wines: it is also rich in minerals, particularly lead, coal, and iron. Many parts of the country are fertile: and the climate, especially in the middle and south, is genial and healthy.

SPAIN has lost much of its former power and wealth since its colonies in America declared themselves independent. Before the late war, the monarchy was absolute: at present it can scarcely be considered as settled. The established, and only tolerated religion, is the Roman Catholic. Spain is a warm country, and the soil, in many places, is rich and fertile, producing excellent wheat, barley and other kinds of grain, besides fruit, oil and wine. It is remarkable for its excellent breed of horses and sheep; and it contains various mines of gold, silver, copper, lead, and tin.

PORTUGAL was formerly one of the principal commercial states of Europe: but it has long since declined greatly in importance. The government is absolute monarchy: the religion is Roman Catholic. The principal export is Port wine, which takes its name from the city of Oporto.

BELGIUM was, till lately, united with Holland, and formed part of the kingdom of the Netherlands; but the two countries are now separated. The climate of this part of Europe is mild: and the land, which is extremely flat, is in the highest state of cultivation. Most of the inhabitants profess the Roman Catholic religion; and the government is limited monarchy. Long ago, the Flemings with their neighbors, the Dutch, were the greatest merchants and manufacturers in Europe; and they are still remarkable for industry and love of gain, and for habits of order, neatness, and cleanliness.

HOLLAND is a remarkably level country, with a cold, moist climate in the north. In winter the Zuyder Zee, and the canals and rivers are generally frozen over, so that people travel from one place to another by skating, and the country girls proceed in this way to the market, carrying baskets of eggs or other articles on their heads. The country is intersected in every direction with canals for the conveyance of goods and passengers; and there are great numbers of dikes to prevent inundation. The form of government resembles that of Great Britain; the religion is Presbyterian.

GERMANY consists of a number of states which sometimes meet, by their representatives, in a General Diet, commonly held at Frankfort on the Maine. In the southern parts of the country, the prevailing religion is the Roman Catholic; in the northern, it is Protestantism in its different shades: and in the middle there is a pretty equal mixture of both. Germany is famous for its mineral waters and baths.

DENMARK was very formidable to the rest of Europe, during the ninth, tenth and eleventh centuries, when it was constantly sending forth bands of pirates, to plunder and destroy wherever they came; but it has occupied a very inconsiderable place in the history of later times. The government is absolute in principle, though it is far from being unlimited in practice. The established religion is Lutheranism; but there is toleration for all other denominations. The principal products of Denmark are corn, horses and cattle. There are scarcely any manufactures except for home comsumption.

SWEDEN AND NORWAY have formed one kingdom since the year 1814. The government is a limited monarchy; and the greater part of the inhabitants of both countries profess Lutheranism, which is the established religion. The climate is cold, and very little of the land is fit for cultivation; but the mines are numerous and valuable, especially those of iron and copper. Norway also exports great quantities of timber, pitch, and tar.

The north of Sweden and the adjoining part of Russia are called LAPLAND, which, though of no political importance, presents many interesting peculiarities. Neither the climate nor the soil is well adapted for vegetation; but when corn can be sown, the growth is so rapid that what is planted in the end of May is often reaped before the beginning of August. In winter, on the other hand, water is often frozen in the vessel as the person is in the act of drinking it; and even spirits of wine are sometimes converted into ice. To protect them from the cold the inhabitants generally wear clothes made with sheepskin, with the wool turned towards the body, and above these, outer garments made of the skins of rein-deer, with the hairy side out. They place the fires in the middle of their huts, and cover the floors with skins, on which they both sit and sleep. They live, for the most part, on flesh, fish, and the milk of the rein-deer. This animal is invaluable to the Laplanders. During its life it draws them about over the frozen surface of the snow in sledges made of birch ; and after its death it yields them almost every necessary of life. The Laplanders are a harmless, inoffensive people.

The RUSSIAN EMPIRE is by far the greatest in extent which has ever existed in the world ; only about one-fourth of it is in Europe. The government is an absolute monarchy, uncontrolled by anything but the customs and habits of the people, which have sometimes proved stronger than the power of the emperor. The religion of the state, and of the great mass of the people, is that of the Greek church. The exports of Russia are corn, hemp, flax, tallow, iron, furs, and timber ; its imports are cotton and woollen goods, tea, sugar, coffee, fruit and wine.

PRUSSIA is for the most part a cold and moist country, abounding in forests and marshes. Its chief productions are timber, corn, and amber ; its manufactures are linen and broad-cloth. Persons of all creeds are eligible to every office in the state ; the government is simple monarchy.

The AUSTRIAN EMPIRE is very extensive, comprehending parts of Germany, Poland, and Italy, with Hungary and several smaller provinces. The power of the emperor is limited only by established laws and customs; the religion of the state is the Roman Catholic. In several parts of the Austrian dominions there are manufacrures of woollens, linens, silks, and various other articles there are also valuable mines, particularly of quicksilver

POLAND was formerly a powerful and warlike state; but it was dismembered towards the end of the last century, and its territories seized by Russia, Prussia, and Austria.

SWITZERLAND is the highest and most mountainous country in Europe, and is celebrated for its bold and sublime scenery. The principal mountains are the Alps, which occupy the greater part of the south and east of the country. Many of these are always covered with snow, and between their summits lie the glaciers or fields of ice. The snow sometimes rolls down in great masses called *avalanches*, which overwhelm cattle, houses, and even whole villages. Switzerland is divided into twenty-one cantons, each of which has a separate government and distinct laws; and the whole are united into one Republic, which is administered by a diet, composed of members from all the inferior governments. In some of the cantons the Protestant religion is established, and in others the Roman Catholic. Cotton goods, linen, and silk, are manufactured on a small scale; and 250,000 watches are annually sent abroad to be sold in other countries.

Italy is one of the finest countries in Europe. It produces, in great abundance and excellence, almost every kind of fruit or grain that is to be found in temperate climates. But the inhabitants of the lower grounds often suffer severely from the *malaria*, a species of noxious air, which causes fevers. The Italians have long been celebrated for their fine natural taste, especially in poetry, painting, and music; and their country is rendered peculiarly interesting by the remains of ancient art, with which every part of it abounds. It is divided into a number of states, in all of which the government is despotic, and the religion Roman Catholic.

TURKEY possesses an excellent climate, and a soil which is naturally very fertile, except in the mountainous districts. Its principal productions are rice, wheat, grapes, figs, olives, oranges and other fruits; and, in the north, there are very rich pastures. The manufactures are chiefly carpets, silks, and Turkey leather. But every kind of improvement and industry is greatly checked by the despotic nature of the government which is administered by the emperor or sultan, assisted by the divan or council of state. The established religion is Mahomedanism; but nearly two-thirds of the population are Christians of the Greek church.

GREECE, in the south of Turkey, has lately been erected into an independant state, under the protection of England, France, and Russia.

## LESSON II.

### THE BRITISH EMPIRE.

In Europe, the British Empire borders at once, towards the north, upon Denmark, upon Germany, upon Holland, upon France; towards the south, upon Spain, upon Sicily, upon Italy, upon Western Turkey. It holds the keys of the Adriatic and the Mediterranean. It commands the mouth of the Black Sea, as well as of the Baltic.

In America it gives boundaries to Russia towards the pole, and to the United States towards the temperate regions. Under the torrid zone it reigns in the midst of the Antilles, encircles the Gulf of Mexico, till, at last, it meets those new states, which it was the first to free from their dependence on their mother country, to make them more surely dependent upon its own commercial industry:—and, at the same time, to secure, in either hemisphere, any mortal who might endeavour to snatch the heavenly fire of its genius, or the secret of its conquests, it holds, midway between Africa and America, and on the road which connects Europe with Asia, that rock to which is chained the Prometheus of the modern world.

In Africa—from the centre of that island which was devoted of yore to the safety of every Christian flag—the British Empire enforces from the Barbary States that respect which they pay to no other power. From the foot of the Pillars of Hercules, it carries dread into the remotest provinces of Morocco. On the shores of the Atlantic it has built the forts of the Gold Coast and the Lion's Mountain. On the same continent, beyond the tropics, and at the point nearest to the Austral pole, it has possessed itself of a shelter under the very Cape of Storms.—Where the Spaniards and the Portuguese thought only of securing a port for their ships to touch at—where the Dutch perceived no capabilities beyond those of a plantation—it is now establishing the colony of a second British people; and, uniting English activity with Batavian patience, at this moment it is extending around the Cape the boundaries of a settlement which will increase in the south of Africa to the size of those states which it has founded in the north of America. From this new focus of action and of conquest, it casts its eyes towards India; it discovers, it seizes the stations of most importance to its commercial progress.

Finally—As much dreaded in the Persian Gulf and the Erythrean Sea, as in the Pacific Ocean and the Indian Archipelago—the British Empire, the possessor of the finest countries of the earth, beholds its factors reign over eighty millions of subjects. The conquests of its merchants in Asia begin where those of Alexander ceased, and where the terminus of the Romans could never reach. At this moment, from the banks of the Indus to the frontiers of China—from the Ganges to the mountains of Thibet—all acknowledge the sway of a mercantile company, shut up in a narrow street in the City of London.

M. Dupin.

## LESSON. III.

### THE RUINS OF HERCULANEUM.

An inexhaustible mine of ancient curiosities exists in the ruins of Herculaneum, a city lying between Naples and Mount Vesuvius, which, in the first years of the reign of Titus, was overwhelmed by a stream of lava from the neighbouring volcano. This lava is now of a consistency which renders it extremely difficult to be removed; being composed of bituminous particles, mixed with cinders, minerals, and vitrified substances, which altogether form a close and ponderous mass.

In the revolution of many ages, the spot it stood upon was entirely forgotten; but in the year 1713 it was accidentally discovered by some labourers, who in digging a well, struck upon a statue on the benches of the theatre. Several curiosities were dug out and sent to France, but the search was soon discontinued, and Herculaneum remained in obscurity till the year 1736, when the King of Naples employed men to dig perpendicularly eighty feet deep; whereupon not only the city made its appearance, but also the bed of the river which ran through it.

In the temple of Jupiter were found a statue of gold, and the inscription that decorated the great doors of the entrance. Many curious appendages of opulence and luxury have since been discovered in various parts of the city, and were arranged in a wing of the palace of Naples, among which are statues, busts and altars; domestic, musical, and surgical instruments; tripods, mirrors of polished metal, silver kettles, and a lady's toilet, furnished with combs, thimbles, rings, ear-rings, &c. &c.

A large quantity of manuscripts was also found among the ruins; and very sanguine hopes were entertained by the learned, that many works of the ancients would be restored to light, and that a new mine of science was on the point of being opened; but the difficulty of unrolling the burnt parchments, and of deciphering the obscure letters, has proved such an obstacle, that very little progress has been made in the work.

The streets of Herculaneum seem to have been perfectly straight and regular; the houses well built, and generally uniform; and the rooms paved either with large Roman bricks, mosaic work, or fine marble. It appears that the town was not filled up so unexpectedly with the melted lava, as to prevent the greatest part of the inhabitants from escaping with their richest effects; for there were not more than a dozen skeletons found, and but little gold or precious stones.

The town of Pompeii was involved in the same dreadful catastrophe, but was not discovered till near forty years after the discovery of Herculaneum. Few skeletons were found in the streets of Pompeii, but in the houses there were many, in situations which plainly proved that they were endeavouring to escape when the tremendous showers of ashes intercepted their retreat.

KOTZEBUE.

## LESSON IV.

### MONT BLANC.

This mountain, so named on account of its white aspect, belongs to the great central chain of the Alps. It is truly gigantic, and is the most elevated mountain in Europe, rising no less than 15,872 feet, somewhat more than three miles, above the level of the sea. It is encompassed by those wonderful collections of snow and ice called glaciers, the principal of which are called Mount Dolent and Triolet. The highest part of Mont Blanc, named the Dromedary, is in the shape of a compressed hemisphere. From that point it sinks gradually, and presents a kind of concave surface of snow, in the midst of which is a small pyramid of ice. It then rises into a second hemisphere which is named the Middle Dome; and thence descends into another concave surface, terminating in a point, and, among other names bestowed on it by the Savoyards, is styled Dôme de Gouté and may be regarded as the inferior dome.

The first successful attempt to reach the summit of Mont Blanc was made in August, 1786, by Dr. Paccard, a physician of Chamouni. He was led to make the attempt by a guide named Balma, who, in searching for crystals, had discovered the only practicable route by which so arduous an undertaking could be accomplished. The ascent occupied fifteen hours, and the descent five, under circumstances of the greatest difficulty; the sight of the Doctor, and that of his guide, Balma, being so affected by the snow and wind as to render them almost blind, at the same time that the face of each was excoriated, and the lips exceedingly swelled.

On the 1st of August, of the following year, 1787, the celebrated naturalist, M. de Saussure, set out, accompanied by a servant and eighteen guides, who carried a tent and mattresses, and various instruments of experimental philosophy. The first night they passed under the tent, on the summit of the mountain of La Côte. The journey thither was exempt from trouble or danger, as the ascent is always over turf, or on the solid rock; but above this place it is wholly over ice or snow.

Early next morning they traversed the glacier of La Côte to gain the foot of a small chain of rocks, inclosed in the snows of Mont Blanc. The glacier is intersected by wide deep irregular chasms, which frequently can be passed only by bridges of snow, which are suspended over the abyss. After reaching the ridge of rocks the track winds along a hollow, or valley, filled with snow, which extends north and south, to the foot of the highest summit, and is divided at intervals by enormous crevices. These show the snow to be disposed in horizontal beds, each of which answers to a year; and, notwithstanding the width of the fissures, the depth can in no part be measured. At four in the afternoon, the party reached the second of the three great platforms of snow they had to traverse, and here they encamped at the height of 12,768 feet, nearly two miles and a half above the level of the sea.

From the centre of this platform, inclosed between the farthest summit of Mont Blanc on the south, its high steps or terraces on the east, and the Dôme de Gouté on the west, nothing but snow appears. It is quite pure, of a dazzling whiteness, and on the high summits presents a singular contrast with the sky, which, in these elevated regions, is almost black. Here no living being is to be seen; no appearance of vegetation; it is the abode of cold and silence. "When," observes M. de Saussure: "I represent to myself Dr. Paccard and James Balma first arriving on the decline of day, in these deserts, without shelter, without assistance, and even without the certainty that men could live in the places which they proposed to reach and still pursuing their career with unshaken intrepidity, it is impossible to admire too much their strength of mind and their courage."

The company departed at seven the next morning to traverse the third and last platform, the slope of which is extremely steep, being in some places thirty-nine degrees. It terminates in precipices on all sides; and the surface of the snow was so hard, that those who went foremost were obliged to cut places for the feet with hatchets. The last slope of all presents no danger; but the air possesses so high a degree of rarity, that the strength is speedily exhausted, and on approaching the summit, it was found necessary to stop every fifteen or sixteen paces to take breath. At eleven they reached the top of the mountain, where they continued four hours and a half, during which time M. de Saussure enjoyed, with rapture and astonishment, a view the most extensive as well as the most rugged and sublime in nature, and made those observations which have rendered this expedition important to philosophy.

A light vapour, suspended in the lower regions of the air, concealed from the sight the lowest and most remote objects, such as the plains of France and Lombardy; but the whole surrounding assemblage of high summits appeared with the greatest distinctness.

M. de Saussure descended with his party, and the next morning reached Chamouni, without the slightest accident. As they had taken the precaution to wear veils of crape, their faces were not excoriated, nor their sight debilitated. The cold was not found to be so extremely piercing as it was described by Dr. Paccard.. By experiments made with the hygrometer on the summit of the mountain, the air was found to contain a sixth portion only of the humidity of that of Geneva: and to this dryness of the air M. de Saussure imputes the burning thirst which he and his companions experienced. It required half an hour to make water boil, while at Geneva fifteen or sixteen minutes sufficed, and twelve or thirteen at the seaside. None of the party discovered the smallest difference in the taste or smell of bread, wine, meat, fruits, or liquors, as some travellers have pretended is the case at great heights; but sounds were, of course, much weakened, from the want of objects of reflection. Of all the organs, that of respiration was the most affected, the pulse of one of the guides beating ninety-eight times in a minute, that of the servant one hundred and twelve, and that of M. de Saussure one hundred and one; while at Chamouni the pulsations respectively were forty-nine, sixty, and seventy-two. A few days afterwards, Mr. Beaufoy, an English gentleman, succeeded in a similar attempt, although it was attended with greater difficulty, arising from enlargements in the chasms in the ice.

CLARKE'S *Wonders.*

## LESSON V.

### RUSSIA—WIRTEMBERG—TYROL.

RUSSIA.— The diversified soil, climate, and surface of Russia enable it to support a vast variety of vegetable productions. In an agricultural point of view, the whole polar district is of no value whatever; a few firs and junipers, with some mosses and a few grasses, being the sole produce of the soil. The districts watered by the Volga are tolerably fertile as far as the steppes near Astracan. The most fertile part of European Russia is the track watered by the Dnieper and Don rivers, called the Ukraine, and the government of Voronesch. In these extensive plains, as well as on the lower shores of the Volga, the soil is a rich black mould, strongly impregnated with nitre, and formed from successive layers of vegetable remains. In Livonia the soil is excellent. The plains on the Don, are too rich for being manured. The southernmost parts of Finland are well cultivated by the peaceful and industrious Fins. The fact is, that the tracts conquered at different periods since the reign of Peter the Great, from Turkey, Sweeden, Poland, and Persia, in respect of fertility of soil, abundance and variety of produce, are worth more than all the rest of the Russian empire together. Rice succeeds well near Kislar, in Circassia. Hops are found in a wild state in Taurida. Tobacco is cultivated to a considerable extent in the south. The olive has been tried in vain near Astracan, but prospers in the southern parts of the Crimea and Taurida. Sugar-melons abound near the Don and Volga. Excellent artichokes are raised at Kief. Forests of cherry-trees are found in Valdimir, prunes in little Russia and Cherson, and walnuts in Taurida, where are also found apricots, peaches, chestnuts, almonds, figs, pistacio, and hazel-nuts. On the Uralian heights are cedar-nuts. The cultivation of the vine is at present confined to the country of the Don Cossacks, Taurida, and some districts upon the Pruth in Moldavia. Pine soda is produced in Taurida.

WIRTEMBERG.—A few small tracts excepted, Wirtemberg is one of the most fertile and well-watered countries in Germany. It generally consists of champaign lands, and pleasant vales abounding in every necessary of life. Its fertility is such that much more grain is raised than suffices for internal consumption, and hence considerable quantities are exported. Flax and hemp are also cultivated. The valleys, which are some of them eight miles in length, are almost covered with forests of fruit-trees, which are also abundant in other parts of the country, so that cider and perry are the liquors drunk by the peasants when wine happens to be scarce and dear. The mountains are rich in minerals and covered wtih vines. The wines are palatable and wholesome, and are generally denominated Neckar wines. Cherries are grown in great quantities in the districts of the Alb and Black Forest. Game and poultry are abundant, and large herds of horned cattle are reared in various parts of the country. In the neighbourhood of Ulm, a particular branch of industry is the feeding of snails: millions of these animals are fattened here and sent to Vienna and Italy.

TYROL.—The Tyrolese mountains present every aspect, from the ever-blooming verdure of perpetual Spring, to the dreary sterility of the frigid zone. Though their summits are always covered with snow, yet their sides are clothed with the finest woods, abounding in every variety of forest-trees and sheltering numerous species of game. Their valleys, though rocky in soil, have rich and extensive fields of corn, flax, and tobacco. On the eminences which crown these fertile vales, various sorts of fruit are grown, as also small woods of chesnut trees: the vine is reared as far as Brixen. The rugged aspect of this elevated country, contrasted with the beauty and fertility of its vales, gave rise to a saying of the emperor Maximilian, "that the Tyrol was like a peasant's frock—coarse, indeed, but right warm."

BELL'S *Geography*.

## LESSON VI.

### GERMANY—DENMARK.

GERMANY.—No country in the world has undergone a greater transformation in respect of climate than Germany; and nowhere have the striking effects of civilization been more clearly manifested. In perusing the accounts which the Romans have given us respecting the climate, soil, and produce of Germany, in their days, one would imagine himself reading an account of the uncleared parts of Canada. According to them, the climate was intensely cold, the country barren, uncultivated, and covered with dreadful frosts and hideous marshes, at once offensive to the senses and deleterious to the human constitution. That the climate was not altogether so bad as they affirmed, is proved by the experience of the Romans themselves, who introduced the cultivation of the vine into the Roman provinces of the Upper Rhine and the Moselle. But it required the lapse of many centuries of civilization to overcome the natural asperities of this country. Germany occupies the middle degrees of the northern temperate zone; but the climate is very various on account of the different elevations above the sea, and the more or less mountainous nature of the districts; however, it is on the whole temperate and healthy. The finest and mildest part of Germany is the central region of the country, extending from 48° to 51°; in the more southern provinces, the high mountains create a rude cold climate, although the plains and valleys enjoy a very warm temperature and an almost Italian clime. The northern provinces are colder and more damp and unhealthy. The seasons in Germany are far from favourable for bringing the grape to full maturity, yet the vine grows to a considerable extent in the fifty-first parallel. On the most southern point of the Tyrol, and on the coast in the Gulf of Venice, some olives and other fruits of the south ripen. Chestnuts and almonds are found at the Rhine. Peaches and apricots are abundant under the fiftieth and fifty-second parallels, and are found in smaller quantities farther to the north. The different kinds of Rhine wine are well known in this country, under the name of *hock*. Iceland moss has been successfully reared on some of the high mountains.

DENMARK.—The appearance of Denmark, particularly of the Islands of Zealand and Funen and of Sleswick upon the continent, is that of a level country, in general well cultivated. It affords nothing which can properly be called a mountain. The coasts are in some parts steep and bold, but in general they are low and sandy. In the isles there are some woods, and forests are found in Jutland. Zealand is a fertile and pleasant country, with fields separated by mud walls; cottages either of brick or whitewashed: woods of beech and oak, vales, small lakes, and gentle hills. Funen is said to be as well cultivated as most of the counties in England. Towards the west, where the Jutland peninsula terminates in the Baltic, everything assumes an aspect of barrenness and desolation. It has been compared to Arabia, without its rivers or its verdant oases; but not without its tempests and sands, which sometimes overwhelm what little agriculture there is, and add much to the habitual wretchedness of the Jutlander. The Danish continent may be described as a vast plain, through which a sandy barren ridge stetches from south to north, commencing in the German counties of Mecklenburgh and Lunenburg, and terminating in the extreme north in the promontary of Skagen. The coast of the peninsula is quite flat towards the German Ocean, but intermixed with quicksands, and towards the Elbe, protected by large dams against the encroachments of the sea. Towards the Baltic the land is more elevated, and offers finer and more picturesque points of view than the west coast, which has no wood. The German Ocean has frequently burst through the isthmus which connects the northern extremity of Jutland with the rest of the peninsula. In 1826, three rapid currents united the North Sea with the Lymfiord; similar devastations have repeatedly occurred along the western coast. BELL'S *Geography.*

## LESSON VII.

### SWEDEN.

During a journey through Sweden I had frequent opportunities of observing the customs, manners, and food of the peasants. Upon entering a cottage, I usually found all the family employed in carding flax, spinning thread, and in weaving coarse linen, and sometimes cloth. The peasants are excellent contrivers, and employ the coarsest materials to some useful purpose. They twist ropes from swine's bristles, horses' manes, and bark of trees, and use eel-skins for bridles. Their food principally consists of salted flesh and fish, eggs, milk, and hard bread. At Michaelmas they usually kill their cattle, and salt them for the ensuing winter and spring. Twice in the year they bake their bread in large round cakes, which are strung upon files of sticks, and suspended close to the ceilings of the cottages. They are so hard as to be occasionally broken with a hatchet, but are not unpleasant. The peasants use beer for their common drink, and are much addicted to malt spirits. In the districts towards the western coast, and at no great distance inland, tea and coffee are not unusually found in the Swedish cottages, which are procured in great plenty, and at a cheap rate, from Gottenburg. The peasants are all well clad in strong cloth of their own weaving. Their cottages, though built of wood, and only of one story, are comfortable and commodious. The room in which the family sleep is provided with ranges of beds in tiers—if I may so express myself—one above the other; upon the wooden testers of the beds in which the women lie, are placed others for the reception of the men, to which they ascend by means of ladders. To a person who has just quitted Germany, and been accustomed to tolerable inns, the Swedish cottages, may, perhaps, appear miserable hovels; to me, who had been long used to places of far inferior accommodation, they seemed almost palaces. The traveller is able to procure many conveniences, and particularly a separate room from that inhabited by the family, which could seldom be obtained in the Polish and Russian villages. During my course through these two countries, a bed was a phenomenon which seldom occurred, excepting in the large towns, and even then not always completely equipped; but the poorest huts of Sweeden were never deficient in this article of comfort; and evident proof that the Sweedish peasants are more civilized than those of Poland and Russia. After having witnessed the slavery of the peasants in those two countries, it was a pleasing satisfaction to find myself again among freemen, in a kingdom where there is a more equal division of property; where there is no vassalage; where the lower orders enjoy a security of their persons and property; and where the advantages resulting from this right are visible to the commonest observer. COXE

## LESSON VIII.

### KIOLEN MOUNTAINS.

It is interesting to mark the changes that occur in the great and rapidly ascending heights of the Kiolen mountains. The Lapland vegetation, with which we are familiar in the valleys, gradually disappears under our feet. The Scotch fir soon leaves us; then the birches become shrivelled; now they wholly disappear, and between the bushes of mountain willows and dwarf birches, the innumerable clusters of berry-bearing shrubs have room to spread, blackberries on the dry heights, and mountain brambles on the marshy grounds. We at last rise above them; the blackberries no longer bear; they appear singly, with few leaves, and no longer in a bushy form. At last they disappear, and they are soon followed by the mountain willows. The dwarf birch alone braves the height and the cold, but at last it also yields, before reaching the limit of prepetual snow; and there is a broad border before reaching this limit, on which, besides mosses, a few plants only subsist with great difficulty. Even the rein-deer moss, which vies in the woods with the blackberry in luxuriance of growth, is very unfrequent on such heights. On the top of the mountains, which is almost a table-land, there is no ice, it is true, nor glaciers, but the snow never leaves these heights; and a few single points and spots above this level are alone clear of snow for a few weeks. Here the Laplanders seldom or never come with their rein-deer, except in descending to the valleys. It is a melancholy prospect; nothing in life is to be seen any longer, except, perhaps, occasionally an eagle in his flight over the mountains from one fiord to another. The view is more grateful as we descend, as it is a return from wilderness and solitude to cultivation and society.

VON BUCH.

## LESSON IX.

### BOILING FOUNTAINS OF ICELAND.

Though surrounded by a great multiplicity of boiling springs and steaming apertures, the magnitude and grandeur of which far exceeded any thing we had ever seen before, we felt at no loss in determining on which of them to feast our wondering eyes. Near the northern extremity of the tract rose a large circular mound, formed by the depositions of the fountain, justly distinguished by the appellation of the Great Geyser, from the middle of which a great degree of evaporation was visible. Ascending the rampart, we had the spacious basin at our feet more than half filled with the most beautiful hot crystalline water, which was but just moved by a gentle ebullition, occasioned by the escape of steam from a cylindrical pipe or funnel in the centre. This pipe I ascertained, by admeasurement, to bo seventy-eight feet of perpendicular depth; its diameter is in general from eight to ten feet; but near the mouth it gradully widens, and opens almost imperceptibly into the basin, the inside of which exhibits a whitish surface, consisting of a siliceous incrustation, which has been rendered almost perfectly smooth by the incessant action of the boiling water. The diameter of the basin is fifty-six feet in one direction, and forty-six in another; and, when full, it measures about four feet in depth from the surface of the water to the commencement of the pipe.

On leaving the mound, the hot water passes through a turfy kind of soil, and by acting on the peat, mosses, and grass, converts them entirely into stone, aud furnishes the curious traveller with some of the finest specimens of petrifaction.

Having stood some time in silent admiration of the magnificent spectacle which this matchless fountain, even in a state of inactivity, presents to the view, as there were no indications of an immediate eruption, we returned to the spot where we had left our horses; and as it formed a small eminence at the base of the hill, and commanded a view of the whole tract, we fixed on it as the site of our tents. About thirty-eight minutes past five, we were apprized, by low reports and a slight concussion of the ground, that an eruption was about to take place, but only a few small jets were thrown up, and the water in the basin did not rise above the surface of the outlets. Not being willing to miss the very first symptoms of the phenomenon, we kept walking about in the vicinity of the spring, now surveying some of the other cavities, and now collecting elegant specimens of petrified wood, leaves, &c. on the rising ground between the Geyser and the base of the hill. At fifteen minutes past eight we counted five or six reports, that shook the mound on which we stood, but no remarkable jet followed: the water only boiled with great violence, and by its heavings caused a number of small waves to flow towards the margin of the basin, which, at the same time, received an addition to its contents. Twenty-five minutes past nine, as I returned from the neighbouring hill, I heard reports which were both louder and more numerous than any of the preceding, and exactly resembled the distant discharge of a park of artillery. Concluding from these circumstances that the long-expected wonders were about to commence, I ran to the mound, which shook violently under my feet, and I had scarcely time to look into the basin when the fountain exploded, and instantly compelled me to retire to a respectful distance on the windward side. The water rushed up out of the pipe with amazing velocity, and was projected by irregular jets into the atmosphere, surrounded by immense volumes of steam, which in a great measure hid the column from the view. The first four or five jets were inconsiderable, not exceeding fifteen or twenty feet in height: these were followed by one about fifty feet, which was succeeded by two or three considerably lower; after which came the last, exceeding all the rest in splendour, which rose at least to the height of seventy feet.—The large stones which we had previously thrown into the pipe were ejected to a great height, especially one, which was thrown much higher than the water. On the propulsion of the jets, they lifted up the water in the basin nearest the orifice of the pipe to the height of a foot, or a foot and a half; and, on the falling of the column, it not only caused the basin to overflow at the usual channels, but forced the water over the highest part of the brim, behind which I was standing. The great body of the column (at least ten feet in diameter) rose perpendicularly, but was divided into a number of the most superb curvated ramifications; and several small spoutings were severed from it, and projected in oblique directions, to the no small danger of the spectator, who is apt to get scalded ere he is aware, by the falling jet. On the cessation of the eruption the water instantly sunk into the pipe, but rose again immediately to about half a foot above the orifice, where it remained stationary. All being again in a state of tranquility, and the clouds of steam having left the basin, I entered it, and proceeded within reach of the water, which I found to be 183° of Fahrenheit, a temperature of more than twenty degrees less than at any period while the basin was filling, and occasioned, I suppose, by the cooling of the water, during its projection into the air.

The whole scene was indescribably astonishing; but what interested us most, was the circumstance, that the strongest jet came last, as if the *geyser* had summoned all her powers in order to show us the greatness of her energy, and to make a grand finish before retiring into the subterraneous chambers in which she is concealed from mortal view. Our curiosity had been gratified, but it was far from being satisfied. We now wished to have it in our power to inspect the mechanism of this mighty engine and obtain a view of the springs by which it is put in motion; but the wish was vain, for they lie in "a track which no fowl knoweth, and which the vulture's eye hath not seen;—which man, with all his boasted powers, cannot and dare not approach. While the jets were rushing up towards heaven with the velocity of an arrow, my mind was forcibly borne along with them to the contemplation of the great and omnipotent JEHOVAH, whose almighty command spake the universe into being, and at whose sovereign fiat the whole fabric might be reduced in an instant to its original nothing.

HENDERSON.

## LESSON X.

### NOTES ON ASIA.

ASIATIC TURKEY comprehends several districts of country, which, in ancient times, were the principal seats of civilization and refinement; but, though it continues to possess great natural advantages, these are very imperfectly cultivated by its present inhabitants. The chief manufactures are carpets, silk and cotton goods, with Angora stuffs, made of the hair of a particular kind of goats found in no other part of the world. It also exports rhubarb and other drugs, for which it receives in exchange the manufactures and produce of Europe, particularly of England. The established religion is Mohammedanism; and the country is governed by Pachas subject to the Turkish emperor.

ARABIA is an interesting country, both from its ancient and modern history. Ishmael, the son of Abraham, setled in the northren parts of it, and from him are probably descended the Bedouins or wandering Arabs. The customs and manners of these singular tribes still bear a striking resemblance to those described in the writings of Moses; and the prediction of the angel of the Lord is remarkably fulfilled in "their hand being against every man, and every man's hand against them." Arabia is celebrated in modern history as the native country of Mohammed or Mahomet, who was born at Mecca, in the year of our Lord 569. Propagating his opinions by means of the sword, this extraordinary man soon spread his religion over all the adjoining parts of Arabia, from which it was carried by his followers into Africa, Spain, and Turkey in Europe. In all these countries, with the exception of Spain, it is still the prevailing religion. The northern parts of Arabia are very barren, consisting of little else than extensive deserts of sand; but several districts in the south are very fertile, producing great abundance of coffee, grain, drugs, and perfumes. The horses, camels, and asses of Arabia are the finest in the world.

PERSIA was the principal seat of one of the great empires of antiquity, and is still a powerful and important kingdom. The soil is naturally fertile, and when properly watered, produces wheat, rice, and other kinds of grain; and there are mines of copper, iron, and silver. The government is despotic, and the religion Mohammedanism, though the Persians are of a different sect from the Turks.

INDIA deserves to be regarded as one of the most important countries in the world, whether we consider its extent, its riches, or its connexion with Europe. It contains a population of nearly two hundred millions, about a fifth of whom are Mahometans, and the greater part of the remainder of the Hindoo or Brahminical religion. The soil or vegetable mould is, in many of the plains and valleys, six feet deep, and yields two harvests in the year. In some of the higher regions, however, the soil is barren, and the climate temperate or cold. The productions of India are timber of various kinds, medicinal plants, cotton, silk, rice, dye-stuffs, and fruits. It is also very rich in minerals, producing gold, silver, copper, iron, &c., besides diamonds and other precious stones. The principal animals are horses, asses, black cattle, sheep, camels, elephants, rhinoceroses, apes, monkeys, and almost all the ferocious animals, except the lion. The Bengal tiger is of great size and strength, and is one of the most dreadful animals any where to be found. The Hindoos are divided into four *castes*: the Brahmins or priest; the Rajas or soldiers; the Vaisyas or husbandmen; and the Sudras or labourers. Each of these castes is governed by its own laws, and no person is allowed to change from that to which he belongs by birth. The English began to trade with India in the reign of Elizabeth, and the East India Company was established in 1600, since which period its possessions have been gradually extending, till they now comprehend the greater part of Hindostan.

*India beyond the Ganges* resembles Hindostan in climate, soil, and productions. The principal state is the Burman Empire, the government of which is despotic, and the religion Buddhism.

THIBET is the Switzerland of Asia, and contains the highest mountains in the world. It was formerly governed by a Lama, who is still worshipped as the deity of the country, and who is believed never to die, the soul of the preceding Lama passing, at his dissolution, into the body of his successor. Thibet is now subject to China, and is governed by laws resembling those of Hindostan. It produces wheat, peas, barley, and various kinds of fruit. Gold is also found both in mines and in the sands of the rivers; and tinkal or borax, which is peculiar to the country, is procured in a crystallized state. Thibet is also famous for its beautiful shawls, which are made of the undermost hair of goats.

CHINA is thought to have existed longer in its present state than any other country in the world; but its history is very little known. The soil is generally fertile, and the climate genial. It yields most of the vegetable productions of Europe, besides tea, and several other plants, which are peculiar to itself. There are also manufactures of silk, cotton, woollen goods, and porcelain: for the manufacture of the last article the Chinese have long been famous, their superiority being partly owing to the excellence of their materials. The government is despotic, and is administered, under the Emperor, by officers called Mandarins. The religion is idolatry, divided into a great number of different sects. The chief curiosity of China is the great wall erected to prevent the incursions of the

Tartars, which is about 1500 miles long, from fifteen to thirty feet high, and so broad that, in many places, six horsemen may ride abreast on the top.

TARTARY comprehends all the country which was known, in ancient times, by the name of Scythia; and the inhabitants are supposed to have undergone very little change in their customs and manner of living. They generally live in tents, and remove from one place to another, according as they can find pasture for their flocks. These constitute almost their whole wealth, a rich Tartar being sometimes known to possess 10,000 horses, 4000 black cattle, and 20,000 sheep, besides camels and goats The Tartars are idolaters in religion; and the government is patriarchal, each tribe being ruled by its own khan or chief. All the eastern part of Tartary owns a nominal subjection to the emperor of China.

SIBERIA is a cold and barren country, subject to the emperor of Russia; but it contains many valuable mines of gold, silver, copper, lead, and iron. The inhabitants are rude and uncivilized; those in the south resembling the Tartars, and those in the north being like the Laplanders in their customs and habits.

The islands of Asia are also deserving of notice. CEYLON produces cinnamon, cocoa-nuts, sago, rice, oranges, bamboos, sugar-canes, and tobacco: it is also uncommonly rich in gems, such as amethyst, topaz, garnet, pearls, &c.: and it abounds with elephants and other quadrupeds, besides a great variety of beautiful and useful birds. The SUNDA ISLANDS are famous for their spices. AUSTRAL-ASIA comprehends New Holland and many other islands in the south-east, which are more remarkable for their extent than for their importance. The JAPAN ISLANDS are formed into an empire, which bears a strong resemblance to that of China.

## LESSON XI.

### MOUNT OF OLIVES.

Leaving the mountain, and regaining the road which conducts towards the east into the Valley of Jehoshaphat, we passed the Fountain Siloa, and hence ascended to the summit of the Mount of Olives: passing in our way a number of Hebrew tombs. The Arabs on the top of this mountain are to be approached with caution, and with a strong guard. Here, indeed, we stood upon holy ground; and it is a question, which might be reasonably proposed to Jew, Christian, or Mohammedan, whether, in reference to the history of their respective nations, it be possible to obtain a more interesting place of observation. So commanding is the view of Jerusalem afforded in this situation, that the eye roams over all the streets, and around the walls, as if in the survey of a plan or model of the city. The most conspicuous object is the mosque erected upon the site and foundation of the temple of Solomon. this edifice may, perhaps, be considered as the finest specimen of Saracenic architecture which exists in the world. About forty years before the idolatrous profanation of the Mount of Olives by Solomon, his afflicted parent, driven from Jerusalem by his son Absalom, came to this eminence to present a less offensive sacrifice.

What a scene does the sublime, though simple, description, given by the prophet, picture to the imagination of every one who has felt the influence of filial piety, but especially of the traveller standing upon the very spot where the aged monarch gave to Heaven the offering of his wounded spirit: "And David went up by the ascent of Mount Olivet, and wept as he went up, and had his head covered; and he went barefoot: and all the people that were with him covered every man his head, and they went up weeping." Abstracted from every religious view, and considered solely as a subject for the most gifted genius in poetry or in painting, it is, perhaps, impossible to select a theme more worthy the exercise of exalted talents. Every thing that is sublime and affecting seems to be presented in the description of the procession or march of David, in his passage across the Kedron; and particularly in the moment when the Ark of the Covenant is sent back, and the aged monarch having in vain entreated Ittai to leave him, begins to ascend the mountain, preceded by the various people said to form the van of the procession. Every wonderful association of natural and of artificial features, of landscape and of architecture, of splendid and diversified costume, of sacred pomp, and of unequalled pathos, dignify the affecting scene: here a solemn train of mourners; there the sons, the guardians and companions of the Ark; men, women, children, warriors, statesmen, citizens, priests, Levites, counsellors,—with all the circumstances of grandeur displayed by surrounding objects; by the waters of the torrent; by the sepulchres of the valley; by the lofty rocks, the towers, bulwarks, and palaces of Sion; by the magnificent perspective on every side; by the bold declivities and lofty summits of Mount Olivet; and finally, by the concentration of all that is great and striking in the central group, distinguished by the presence of the afflicted monarch. If it should be urged that this subject is too crowded, it is only so in description; a painter, by the advantages of perspective, easily obviates every objection of this nature. Haste and tumult are, in a certain degree, the requisite characteristics of such a representation: and these a judicious artist would know how to introduce.

DR. CLARKE.

## LESSON XII.

### ARABIA—PERSIA—HINDOSTAN.

ARABIA presents, in general, a large flat arid desert, interspersed with a few fertile spots or oases, and some mountains of considerable height, among which are to be found many valleys of delightful luxuriance. The contrast between the desolation of the desert and the beauty and fertility of those valleys has given rise to a diversity of description regarding this country. Some have represented it as exclusively the habitation of poverty and wretchedness, and quite unable to support its miserable inhabitants; others, who have been fortunate enough to visit the verdant hills of Yemen, and the spicy mountains of Hadramaut, have spoken in raptures of its fertility and salubrity, and represented it as abounding not only in the necessaries but the luxuries of life. Both descriptions, if relating to particular districts, are correct; but neither of them so, if applied to the country generally.

The title of *Happy Arabia*, which was applied in ancient times to the southern provinces, has been supposed to have originated in the contrast that existed between them and the surrounding desert: but it is unfair, amid so much authority, to doubt the former riches of Arabia Felix; and even at this day no spot in the same latitude can compare with it, either in fertility of soil, or mildness of climate. It is also still famed for its frankincense and spices.

Persia.—The general characteristic of Persia is that of a great and elevated plateau, or upland, studded with innumerable mountains, with their corresponding valleys, and immense desert plains. That it is very elevated is proved from the great abundance of snow which rests on the summits of the mountains, although these, for the most part, are but of moderate elevation above the plains. In fact, Persia is a country of mountains, but they seem not to have any general direction, nor to form any continued chain. They extend, without order, in all directions, and are heaped upon one another, as if thrown together at random. Groups, which seem to form the commencement of chains, are suddenly interrupted by smooth, extensive and very elevated plains. The interior mountains are everywhere bare, arid, and forbidding. The plains are equally unattractive, consisting chiefly of gravel washed down from the mountain tops. Water is almost a phenomenon in this arid region, but when it occurs, whether in the valleys or the plains, renders them so much more pleasing and fertile, by their contrast to the naked rocks and sandy saline plains. There are, however, some exceptions to be found to the general picture—some favoured spots to relieve the eye.

HINDOSTAN.—Two sides of the irregular four sided figure which Hindostan forms, are washed by the sea, and the other two are bounded by land. The Bay of Bengal, which washes the south-eastern shore, is not so broad as the Arabian Sea, which laves the south-west side; but the countries on the latter sea, especially towards the north, are more arid and sterile than those which lie along the former. The land boundary on the north west, towards the sea, is flat and desert; as it recedes inland, the elevation increases and the scenery improves. The remaining or north east side of this country, from the termination of the low and swampy grounds near the Bay of Bengal, is formed by mountains of prodigious elevation. From this vast chain the two great rivers of India have their sources, and flow to opposite points of the continent. The countries on the Indus— the central desert, as it is called—and the valley of the Ganges, comprise the whole of India north of a line drawn from the Gulf of Cutch eastward of the mouth of the Indus, to the mouth of the Ganges. All the features of this continental portion of India are on the most magnificent scale; those of the southern or peninsular part are less bold, and partake more of the nature of an island. From the mouth of the Ganges to that of the Krishna, in latitude 16°, the east coast lies nearly in a straight line north-east and south-west, and the general outline of the country is that of a great oval basin, of which the southern portion approaches near to the Arabian Sea, but is divided from it by a high land. From the mouth of the Krishna, a very irregular mountain-barrier, called the Eastern Ghauts, extends southward at a varying distance from the coast, which is here, for the most part, sandy and barren. The elevated country within this mountain-barrier gets the name of *Balaghaut*, or the country " above the gates," in opposition to the *Pageenghaut*, or country " below the gates." The name of Balaghaut is given to the whole upland country, from Cape Comorin to the Ganges. From Cape Comorin another mountain-barrier runs parallel to the western shore, for an extent of about nine hundred miles. It is nearer to the coast, loftier, and less interrupted than the other, and is called the Western Ghauts. The termination towards the north is near the Gulf of Cambay; and here, for a short distance, the general slope of the country is towards the west, where the valley of Norbuddah is formed. Under the thirteenth parallel, the eastern and western Ghauts are connected by a cross ridge, and the country does not immediately slope down to the north and south of this transverse ridge, but forms a table-land of considerable extent.—North of the Gulf of Cambay, the peninsula of Guzerat, beautifully diversified with hill and dale, extends towards the Gulf of Cutch.

Rell's *Geography.*

## LESSON XIII.

### CHINA.

When a European first sets his foot in China, he will find the appearance of the country, the buildings, and the people, so totally different from any thing he had before seen, that he might fancy himself to be transported into a new world. In the long line of internal navigation between the capital and Canton of 1200 miles, with but one short interruption, he will observe each variety of surface, but disposed in a very remarkable manner in great masses: for many days he will see nothing but one uniform extended plain, without the smallest variety; again, for as many days, he will be hemmed in between precipitous mountains of the same naked character, and as unvaried in their appearance as the plains; and, lastly, a ten or twelve day's sail among lakes, swamps, and morasses, will complete the catalogue of monotonous uniformity; but whether he crosses the dry plains of Petchelee and Shauntung, abounding with cotton and all varieties of grain and pulse—the more varied surface of Kiang nan, fertile in yellow cotton, in fruits, in the staple commodity of grain, and in every thing that constitutes the luxuries, the comforts, and the necessaries of the people—the dreary swamps, morasses, and extensive lakes of the northern part of Kiang-see, where men subsist by fishing—or its naked and picturesque mountains to the southward, famous for its porcelain manufactories—or whether he descend to the fertile plains of Quan-tung, in which almost all the vegetable produce of the East may be said to be concentrated, the grand characteristic feature is still the same—a redundant population. Every where he meets with large masses of people, but mostly of one sex; thousands of men in a single group, without a single woman mixing among them—men, whose long gowns and petticoats give them the appearance of the softer sex, while these are sparingly seen at a distance in the background, peeping over the mud walls, or partially hid behind trees and bushes; whose short jacket and trowsers would make them pass for men among strangers, if their braided hair, stuck full of flowers, and their little cramped and bandaged feet, did not betray their sex. He will be pleased with the unequivocal marks of good humour which prevail in every crowd, uninterrupted and unconcerned by the bawling of some unhappy victim suffering under the lash of magisterial correction; and he will be amused at the awkward exertions of the softer sex to hobble out of sight when taken by surprise; but his slumbers will be interrupted on the nights of the full moon by the nocturnal orgies of squibs and crackers, gongs and trumpets, and other accompaniments of boisterous mirth.

A constant succession of large villages, towns, and cities, with high walls, lofty gates, and more lofty pagodas, large navigable rivers, communicating by artificial canals, crowded with both barges for passengers, and barks for burden—as different from each other, in every river and every canal, as they are all different from any thing of the kind in the rest of the world—will present to the traveller an animated picture of activity, industry, and commerce. He will behold, in the lakes and morasses, every little islet crowded with villages and sand-hovels. He will observe birds (the leutse or cormorant) catching fish; and men in the water, with jars on their heads, fishing for birds. He will see shoals of ducks issuing from floating habitations, obedient to the sound of a whistle; carts on the land, driven by the wind; and barges on the water, moving by wheels, like those recently invented in Europe for propelling the steam-boats. Among other strange objects he will observe, at every ten or twelve miles, small military guard-houses, with a few soldiers fantastically dressed in paper helmets and quilted petticoats, making use of the fan if the weather be warm; and falling on their knees, if an officer of rank should pass them.

He will observe that the meanest hut, with walls of clay, and a roof of thatch, is built on the same plan, and of the same shape, with the palace of the viceroy, constructed of blue bricks, and its tiled roof supported on pillars. He will notice that the luxury of glass is wanting in the windows of both; and that while one admits a free passage to the air, the other but imperfectly resists the weather, and as imperfectly admits the light, whether through oiled paper, silk gauze, pearl- shell, or horn.

Nothing, perhaps, will more forcibly arrest the attention of the traveller than the general nakedness of the country as to trees and hedge-rows, of which the latter have no existence, and the former exist only in clumps near the dwellings of the public officers, or the temples of Fo, or Tao-tse. No green meadows will meet his eye; no cattle enliven the scene; the only herbage is on the narrow ridges which divide the plots of grain, or brown fallow, as in the common fields of England. The terraced hills he will probably observe to be terminated with a clump of trees, or a pagoda, the only objects in the distance that catch the eye. But the bridges on the canals, of every variety of shape—circular, elliptical, horse-shoe, Gothic—slight and unstable as they are, are objects that, by their novelty and variety, must attract notice; and the monumental architecture, which adorns the cemeteries under every form, from the lowly tent-shaped dwellings to the loftiest column—the elevated terraces, supported by semicircular walls and the round hillocks, which, in their graduated size, point out the grave of the father, the mother, and the children, according to seniority, are amongst the most interesting objects that China affords.

If, by chance, he should be admitted within the gates of one of their great cities, as Pekin, Nankin, Sau-tcheou-foo, Hang-tcheou-foo, or Canton, he may fancy himself, from the low houses, with curved overhanging roofs, uninterrupted by a single chimney, the pillars, poles, flags, and streamers, to have got into the midst of a large encampment. The glitter arising from the gilding, the varnishing, and the painting in vivid colours, that adorn the front of the shops, and, in particular, the gaily-painted lanterns of horn, muslin, silk, and paper; the busy multitude all in motion, and all of one sex; the painted and gilded inscriptions that, in announcing the articles dealt in, assure passengers "that they don't cheat here;" the confused voice of tinkers, cobblers, and blacksmiths, in their portable work-shops; the buying, selling, bartering, and bawling of different wares; the processions of men, carrying home their new-married wives, with a long train of presents, and squalling and noisy music; or carrying to the grave some deceased relation, with most lamentable howlings; the mirth and burst of laughter occasioned by jugglers, conjurers, mountebanks, quack doctors, musicians, and comedians; in the midst of all which is constantly heard a strange twanging noise from the barber's tweezers, like the jarring sound of a cracked Jew's harp; the magistrates and officers, attended by their lictors, and a numerous retinue, bearing flags, umbrellas, painted lanterns, and other strange insignia of their rank and office; all these present to the eyes and ears of a stranger a novel and interesting spectacle. The noise and bustle of this busy multitude commence with day-light, and cease only with the setting of the sun; after which scarcely a whisper is heard, and the streets are entirely deserted.

ENCYCLOPÆDIA BRITANNICA.

## LESSON XIV.

### NOTES ON AFRICA.

EGYPT is the most interesting and important country in Africa. It consists of the valley formed by the Nile, which overflows its banks once every year, and fertilizes the soil by the rich black mould which it deposits. In ancient times, the Nile emptied itself into the sea by seven mouths, but several of these are now dried up. The land inclosed by the two principal branches still bears the name of the Delta, from its resemblance to the Greek letter so called. Egypt appears to have been one of the first countries in the world where the arts and sciences were cultivated. The pyramids, temples, and other remains of antiquity, display a knowledge of architecture, and must have required the application of mechanical power which have scarcely yet been equalled in modern times. This country is rendered still further interesting from its being so frequently mentioned in the history of the Israelites, particularly before their settlement in Canaan. At present it is governed by a Pacha, who owns a nominal subjection to the Sultan of Turkey. Its productions are rice, wheat, barley, doura, tobacco, flax, sugar-cane, indigo, and cotton, with various kinds of fruit.

NUBIA is a very hot country ; and the soil is not very productive, unless where it is carefully irrigated. For this purpose the water is raised by wheels which are turned by cows. The greater part of the Nubians profess the Mahometan religion ; the rest are idolaters. Most of the country is subject to the Pacha of Egypt.

ABYSSINIA, being more elevated, enjoys a more temperate climate, than either Nubia or Egypt. The principal produce is wheat, barley, maize, various tropical fruits, and numerous perfumes. The country is much infested by lions, panthers, leopards, and others beasts of prey. The government is a despotic monarchy ; the religion is Christianity, corrupted by a mixture of Jewish, Mahometan, and Pagan superstitions. Travellers describe the inhabitants as very depraved and barbarous,

BARBARY comprehends all the northern parts of Africa which lie between Egypt and the Atlantic Ocean, and the Mediterranean Sea and the Sahara or Great Desert. It is divided into a number of states which bear a strong resemblance to one another, in soil, climate, and productions, as well as in the manners and habits of their inhabitants. Many parts of Barbary, especially along the sea-coast, are uncommonly fertile; but most of the interior is covered, with barren deserts. The chief productions are wheat, barley, Indian corn, rice, hemp, flax, cotton, tobacco, sugar-cane, and olives. The religion is Mohammedanism; and all the governments are despotic. The states of Barbary have been long noted for their piracies, for which they have been several times severely punished by some of the nations of Europe.

The SAHARA or GREAT DESERT, which lies to the south of Barbary, extends from Egypt to the Atlantic Ocean, and is, in some places, nearly a thousand miles broad. The greater part of this extensive tract of country is covered with loose sand, and produces little but thorny shrubs, brambles, and nettles. Occasionally, however, travellers meet with fertile and verdant spots, called *oases*, which abound with the most luxuriant productions of tropical climates. Many parts of the desert are infested by lions, panthers, and serpents of extraordinary size; and by bands of Arab Moors, scarcely less savage. Merchants, pilgrims and others, who have occasion to cross the Sahara, travel in considerable numbers, upon camels, sometimes attended by a guard of horsemen; the whole cavalcade thus formed being called a *caravan*. They are often exposed to the greatest distress from the excessive heat, from the *simoom*, and especially from want of water, which sometimes compels the people to kill their camels for the sake of the liquid which these animals retain in their stomach.*

GUINEA, generally divided into Upper and Lower, comprehends all the western coast of Africa from the river

Senegal to the twelfth degree of southern latitude. This is the hottest country in the world; but it is, nevertheless, exceedingly rich in vegetable productions, yielding rice, Indian corn, pine-apples, tobacco, aromatic plants, gums, indigo, and various kinds of fruit and timber-trees. Gold is also found in considerable quantities. Guinea is divided into a great number of states, governed by kings or chiefs, most of whom exercise absolute power. In the northern states, the inhabitants are generally Mahometans but, in the south, the greater number are idolaters. Nearly the whole population of this extensive country is in the grossest state of ignorance and barbarism, to which Europeans have not a little contributed by the infamous traffic in slaves, which has been carried on, with scarcely any interruption, since the year 1503, when it was commenced by the Spaniards and Portuguese.

The country round the Cape of Good Hope is subject to Great Britain. The original inhabitants are the Caffres and Hottentots, who are described as being in a most barbarous and degraded state; which, however, is said to be partly owing to the oppressive cruelty of their former masters, the Dutch, This country possesses a fine climate, and a fertile soil: its principal exports are Cape and Constantia wines. The south east and interior regions of Africa are little known; but, as far as they have yet been explored, they bear a great resemblance in climate, soil, productions, and the state of the inhabitants, to those which have already been described.

## LESSON XV.

### THE PYRAMIDS.

We were roused, as soon as the sun dawned, by Anthony, our faithful Greek servant and interpreter, with the intelligence that the pyramids were in view. We hastened from the cabin; and never will the impression made by their appearance be obliterated. By reflecting the sun's rays, they appear as white as snow, and of such surprising magnitude, that nothing we had previously conceived in our imagination had prepared us for the spectacle we beheld. The sight instantly convinced us, that no power of description, no delineation, can convey ideas adequate to the effect produced in viewing these stupendous mountains. The formality of their construction is lost in their prodigious magnitude; the mind, elevated by wonder, feels at once the force of an axiom, which, however disputed, experience confirms, that in vastness, whatever be its nature, there dwells sublimity. Another proof of their indescribable power is that no one ever approached them under other emotions than those of terror, which is another principal source of the sublime. In certain instances of irritable feeling, the impression of awe and fear has been so great as to cause pain rather than pleasure; hence, perhaps, have originated descriptions of the pyramids which represent them as deformed and gloomy masses, without taste or beauty. Persons who have derived no satisfaction from the contemplation of them, may not have been conscious that the uneasiness they experienced was the result of their own sensibility.

Others have acknowledged ideas widely different, excited by every wonderful circumstance of character and of situation ; ideas of duration, almost endless ; of power inconceivable ; of majesty supreme ; of solitude, most awful ; of grandeur, of desolation, and of repose.

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With what amazement did we survey the vast surface that was presented to us when we arrived at this stupendous monument, which seemed to reach the clouds ! Here and there appeared some Arab guides upon the immense masses above us, like so many pigmies, waiting to show the way to the summit. Now and then we thought we heard voices, and listened ; but it was the wind in powerful gusts sweeping the immense ranges of stone. Already some of our party had begun the ascent, and were pausing at the tremendous depth which they saw below. One of our military companions, after having surmounted the most difficult part of the undertaking, became giddy in consequence of looking down from the elevation be had attained ; and being compelled to abandon the project, he hired an Arab to assist him in effecting his descent. The rest of us, more accustomed to the business of climbing heights, with many a halt for respiration, and many an exclamation of wonder, pursued our way towards the summit. The mode of ascent has been frequently described ; and yet, from the questions which are often proposed to travellers, it does not appear to be generally understood. The reader may imagine himself to be upon a staircase, every step of which, to a man of middle stature, is nearly breast high ; and the breadth of each step is equal to its height : consequently, the footing is secure;

and, although a retrospect, in going up, be sometimes fearful to persons unaccustomed to look down from any considerable elevation, yet there is litile danger of falling. In some places, indeed, where the stones are decayed, caution may be required; and an Arab guide is always necessary, to avoid a total interruption; but, upon the whole, the means of ascent are such that almost every one may accomplish it. Our progress was impeded by other causes. We carried with us a few instruments, such as our boat-compass, a thermometer, a telescope, &c.; these could not be trusted in the hands of the Arabs, and they were liable to be broken every instant. At length we reached the topmost tier, to the great delight and satisfaction of all the party. Here we found a platform, thirty-two feet square, consisting of nine large stones, each of which might weigh about a ton; although they are much inferior in size to some of the stones used in the construction of this pyramid. Travellers of all ages, and of various nations, have here inscribed their names. Some are written in Greek, many in French, a few in Arabic, one or two in English, and others in Latin. We were as desirous as our predecessors to leave a memorial of our arrival: it seemed to be a tribute of thankfulness due for the success of our undertaking; and presently every one of our party was seen busied in adding the inscription of his name.

DR. CLARKE.

# LESSON XVI.

## AFRICAN DESERTS.

The most striking feature of Africa consists of the immense deserts which pervade its surface, and which are supposed to comprise one-half of its whole extent. The chief of these is, by way of eminence, called Saharah, or the Desert. It stretches from the shores of the Atlantic, with few interruptions, to the confines of Egypt, a space of more than forty-five degrees, or twenty-seven hundred geographical miles, by a breadth of twelve degrees, or seven hundred and twenty geographical miles. It is one prodigious expanse of red sand, and sand-stone rock, of the granulations of which the red sand consists. It is, in truth, an empire of sand which seems to defy every exertion of human power or industry, although it is interspersed with various islands, and fertile and cultivated spots of different sizes, of which Fezzan is the chief of those which have been hitherto explored.

Nearly in the centre of this sandy ocean, and nearly mid-way between the Mediterranean Sea and the coast of Guinea, rise the walls of Timbuctoo, the capital of the very interesting empire of Bambarra—a city which constitutes the great mart for the commerce of the interior of Africa. To maintain this commerce is the laborious work of the *akkabaurs* or caravans, which cross this enormous desert from almost every part of the African coast. The mode in which it is traversed is highly curious.

The caravans consist of several hundred loaded camels, accompanied by the Arabs who let them out to the merchants for the transport of their goods. During their route, they are often exposed to the attacks of the roving Arabs of the Sahara, who generally commit their depredations on the approach to the confines of the desert. In this tiresome journey, the caravans do not proceed to the place of their destination in a direct line across the trackless desert, but turn occasionally eastward or westward, according to the situation of certain fertile, inhabited, and cultivated spots, called *oases*, interspersed in various parts of the Sahara, like islands in the ocean. These serve as watering places to the men, as well as to feed, refresh, and replenish the hardy and patient camel. At each of these cultivated spots, the caravan sojourns about seven days, and then proceeds on its journey, until it reaches another spot of the same description. In the intermediate journeys, the hot winds, denominated *shume* or *simoom*, are often so violent, as considerably, if not entirely, to exhale the water carried in skins by the camels for the use of the passengers and drivers. On these occasions, it is affirmed by the Arabs, that five hundred dollars have been frequently given for a draught of water, and that ten or twenty dollars are commonly paid, when a partial exhalation has occurred.

In 1805, a caravan proceeding from Timbuctoo to Tafilet was disappointed in not finding water at one of the usual watering-places, when, horrible to relate, the whole of the persons belonging to it, two thousand in number, besides one thousand eight hundred camels, perished of thirst! Accidents of this nature account for the vast quantities of human and other bones which are found heaped together in various parts of the desert.

The following is the general route of the caravans in crossing the desert:—Having left the City of Fez, the capital of Morocco, they proceed at the rate of three miles and a half an hour, and travel seven hours each day. In the space of eighteen days they reach Akka, where they remain a month, as this is the place of rendezvous at which they are formed into one grand accumulated caravan. In proceeding from Akka to Tagassa sixteen days are employed; and here again the caravan sojourns fifteen days to refresh the camels. It then directs its course to the *oasis* or well of Tandeny, which is reached in seven days; and after another stay of fifteen days, proceeds to Arawan, a watering place, situated at a like distance. After having sojourned there fifteen days, it sets out, and reaches Timbuctoo on the sixth day, after having performed a journey of fifty-four days of actual travelling, and seventy-five of repose, making altogether, from Fez to Timbuctoo, one hundred and twenty-nine days, or four lunar months and nine days.

CLARKE'S *Wonders.*

## LESSON XVII.

### EGYPT.

Savary calls Egypt a terrestrial paradise; Volney, another French author, assures us it is a most unpleasant country to reside in. The fact is, Egypt has four distinct seasons; and as its aspect undergoes periodical and striking changes with the seasons, the description given of it by the traveller entirely depends on the season during which he visits it. The first is that of the inundation of the Nile, which extends from the first day of July to the winter solstice. During the months of August and September, the whole country appears like one vast sea, in which the towns and villages rise like so many islands. During this season the air is moist, and the mornings and evenings are foggy. The second season begins in the middle of December, and lasts till March. Though the nights are cold, this period may be called the Egyptian Spring; the days are hot, and the vegetation is rapid and luxuriant. The third season begins in March, and lasts till the end of May. It has been called the endemic season, from the prevalence of endemic diseases during its continuance. The fourth season, extending from June till the period of the swelling of the Nile, is in the highest degree pleasant and refreshing. The beauty of the night in Egypt has been the theme of every traveller's eulogy. The sky is so cloudless, and the brightness of the moon so intense, that the natives who sleep in the open air—as they are much accustomed to do—usually cover their eyes, in order to save them from being injured by the rays, as their effect upon the sight is said to be very violent. It is a curious meteorological fact, that the abundance of the dews deposited in the night is always in proportion to the clearness of the atmosphere. Excepting along the sea-shore, nothing is rarer in Egypt than rain. The season in which any rain falls is considered winter. At Cairo, there are on average, four or five showers in the year; in Upper Egppt one or two at most. The difference between the greatest heat of summer, and the greatest cold, in Egypt, is about 30°. The thermometer ranges in summer from 90° to 92°; and in winter from 58° to 60°. Frost is very rare. BELL'S *Geography*.

The present state of the land of Egypt is a wonderful testimony to the genuineness of the Bible as a revelation from God. It was foretold by the prophet Zachariah, "that the sceptre of Egypt should depart away;" and by Ezekiel, "that there should be no more a prince in the land of Egypt;" and further, "that it should be a base kingdom—the basest of kingdoms: that it should not exalt itself any more above the nations, nor rule over the nations any more." And how exactly has all this been accomplished since the days of these prophets! The kingdom of Egypt had been one of the most powerful kingdoms in the world. It was for ages the chief seat of arts and sciences, and there are monuments of the power and magnificence of its kings still in existence that are the wonder of the whole world. And the principal part of these prophecies must have been accomplished subsequently to the time of the prophets Ezekiel and Zachariah; for it was not deprived of an independent prince till a few years before the Christian era, and long after the Old Testament Scriptures were translated into Greek, when it was reduced to the state of a Roman province. For several centuries previously, indeed, it had been under the government of a foreign dynasty of kings, but still it was an independent state. Since the conquest of it by the Romans, eighteen centuries ago, it has never been freed from a foreign yoke, and, at this day, it is indeed, a base—the basest of kingdoms. In ancient times its land was proverbially fertile, and it was for ages the granary of Rome; now it scarcely furnishes food for a thinly-scattered population. It is not only tributary to a foreign state, but the natives are under the capricious dominion of a kind of military banditti, who themselves are tributary to the Turkish empire. Thus, they are literally servants of servants.

Carlile *on the Divine Origin of the Bible.*

## LESSON XVIII

### NOTES ON AMERICA.

America was discovered by Christopher Colon or Columbus, a native of Genoa, who, in the year 1492, steered across the Atlantic with three vessels fitted out by Isabella, Queen of Spain, and landed on Guanahani, one of the Bahama islands. This discovery gave an impulse to the exertions of Spain, Portugal, England and France, all of which states soon acquired extensive possessions on the new continent. But, in the course of the wars which these countries carried on with one another, many of the American settlements often changed masters, till about the middle of the last century, when the greater part of North America became the undisputed property of the English and Spaniards, as South America had been, from its discovery, that of the Spaniards and Portuguese.

In the year 1783, the inhabitants of the central part of North America threw off the yoke of Great Britain, and formed themselves into an independent republic, called the United States. The number of these states is twenty-four, each of which, besides having a local legislature to conduct its internal government, is represented by delegates in the general Congress. All religious sects are tolerated, and are allowed to support their own clergy, no public provision being made for the ministers of religion: but great attention is paid to the education of youth, there being not fewer than thirty universities within the Union. The inhabitants are distinguished for their independence, intelligence, and activity, and for the zeal with which they have applied themselves to every species of improvement. The climate, as in the other temperate regions of the globe, is variable; and the soil is generally fertile, producing Indian corn, and other kinds of grain, with fine pasturage.

The countries lying to the north of the United States still acknowledge the supremacy of Great Britain; but their internal affairs are managed by local legislatures. Throughout the greater part of BRITISH AMERICA, the heat in summer, and the cold in winter are excessive. The principal productions are grain, timber, and tobacco; and among the animals are the beaver, otter, martin, &c. which are valuable for their furs.

MEXICO, before its subjugation by the Spaniards, about the beginning of the sixteenth century, enjoyed a regular government, under an emperor; and the people were considerably advanced in civilization: their religion was idolatry. But the country remained a colony of Spain from that period down till the year 1821, when an independent republic was formed. The established religion is Roman Catholic. The principal productions are bananas, maize wheat, barley, sugar-canes, mahogany, and indigo, with cocoa, and various other fruits.

Besides the United States, British America, and Mexico, there are large tracts of this extensive continent which still continue in the possession of the natives. The setlements of the whites, however, are gradually encroaching upon these territories, and at no very distant period, will probably occupy them altogether, the aboriginal inhabitants being doomed, like most of their progenitors, to bondage or extermination. The North American Indians are distinguished by many striking and peculiar customs, as well as by a fierce, vindictive disposition, which certainly has not hitherto been improved by their intercourse with the whites.

In South America, COLUMBIA, PERU, CHILI, and BUENOS AYRES, formerly belonged to Spain, and BRAZIL to Portugal; but all these countries are now independent, the first four having been established into republics by the Spanish colonists, and the Brazilians owning only a nominal subjection to the infant son of their late emperor. The inhabitants of all the South American states are Roman Catholics. Their principal productions are grain of various kinds, sugar, fruits, and cattle; they are also rich in minerals, especially gold and silver; diamonds are found in Brazil.

The principal islands of America belong to the group called the WEST INDIES, the greater part of which belong to Great Britain, Spain, France, and Denmark. The chief productions of these islands are sugar, coffee, and cotton.

# LESSON XIX.

## FALLS OF NIAGARA.

The form of the Niagara Falls is that of an irregular semicircle, about three-quarters of a mile in extent. This is divided into two distinct cascades by the intervention of Goat Island, the extremity of which is perpendicular, and in a line with the precipice over which the water is projected. The cataract on the Canada side of the river is called the Horseshoe, or Great Fall, from its peculiar form—and that next the United States the American Fall.

The Table Rock, from which the Falls of the Niagara may be contemplated in all their grandeur, lies on an exact level with the edge of the cataract on the Canada side, and, indeed, forms a part of the precipice over which the water gushes. It derives its name from the circumstance of its projecting beyond the cliffs that support it like the leaf of a table. At this point a magnificent amphitheatre of cataracts burst upon my view, with appalling suddenness and majesty. However, in a moment the scene was concealed from my eyes by a dense cloud of spray, which involved me so completely, that I did not dare to extricate myself. A mingled and thundering rushing filled my ears. I could see nothing except when the wind made a chasm in the spray, and then tremendous cataracts seemed to encompass me on every side, while below, a raging and foaming gulf of undiscoverable extent lashed the rocks with its hissing waves, and swallowed, under a horrible obscurity, the smoking floods that were precipitated into its bosom. At first the sky was obscured by clouds, but after a few minutes the sun burst forth, and the breeze subsiding at the same time, permitted the spray to ascend perpendicularly. A host of pyramidal clouds rose majestically, one after another, from the abyss at the bottom of the fall; and each, when it had ascended a little above the edge of the cataract, displayed a beautiful rainbow, which in a few minutes was gradually transferred into the bosom of the cloud that immediately succeeded. The spray of the Great Fall had extended itself through a wide space directly over me, and, receiving the full influence of the sun, exhibited a luminous and magnificent rainbow, which continued to overarch and irradiate the spot on which I stood, while I enthusiastically contemplated the indescribable scene.

The body of water which composes the middle part of the Great Fall is so immense, that it descends nearly two-thirds of the space without being ruffled or broken, and the solemn calmness with which it rolls over the edge of the precipice is finely contrasted with the perturbed appearance it assumes after having reached the gulf below. But the water towards each side of the Fall is shattered the moment it drops over the rock, and loses as it descends, in a great measure, the character of a fluid, being divided into pyramidal-shaped fragments, the bases of which are turned upwards. The surface of the gulf below the cataract, presents a very singular aspect; seeming, as it were, filled with an immense quantity of hoar frost, which is agitated by small and rapid undulations. The particles of water are dazzlingly white, and do not apparently unite together, as might be supposed, but seem to continue for a time in a state of distinct comminution, and to repel each other with a thrilling and shivering motion, which cannot easily be described.

The noise made by the Horseshoe Fall, though very great, is less than might be expected. When the weather is clear and frosty, it may be distinctly heard at the distance of ten or twelve miles; but much farther when there is a steady breeze. After leaving the Table Rock, the traveller may proceed down the river nearly half a mile, where he will come to a small chasm in the bank, in which there is a spiral staircase inclosed in a wooden building. By descending the stair, which is seventy or eighty feet perpendicular height, he will find himself under the precipice on the top of which he formerly walked. A high but sloping bank extends from its base to the edge of the river; and on the summit of this there is a narrow slippery path, covered with angular fragments of rock, which leads to the Great Fall. The impending cliffs, hung with a profusion of trees and brushwood, overarch this road, and seem to vibrate with the thunders of the cataract. In some places they rise abruptly to the height of one hundred feet, and display upon their surfaces fossil shells, and the organic remains of a former world; thus sublimely leading the mind to contemplate the convulsions which nature has undergone since the creation. As the traveller advances, he is frightfully stunned by the appalling noise; clouds of spray sometimes envelope him, and suddenly check his faltering steps; rattlesnakes start from the cavities of the rocks, and the scream of eagles soaring among the whirlwinds of eddying vapour which obscure the gulf of the cataract, at intervals announce that the raging waters have hurled some bewildered animal over the precipice. After scrambling among piles of huge rocks that obstruct his way, the traveller gains the bottom of the Fall, where the soul can be susceptible only of one emotion—that of uncontrollable terror.

It was not until I had, by frequent excursions to the Falls, in some measure familiarized my mind with their sublimities, that I ventured to explore the *penetralia* of the Great Cataract. The precipice over which it rolls is very much arched underneath, while the impetus which the water receives in its descent projects it far beyond the cliff, and thus an immense Gothic arch is formed by the rock and the torrent. Twice I entered the cavern, and twice I was obliged to retrace my steps, lest I should be suffocated by the blast of dense spray that whirled around me; however, the third time, I succeeded in advancing about twenty-five yards. Here darkness began to encircle me; on one side, the black cliff stretched itself into a gigantic arch far above my head, and on the other, the dense and hissing torrent formed an impenetrable sheet of foam, with which I was drenched in a moment. The rocks were so slippery, that I could hardly keep my feet or hold securely by them; while the horrid din made me think the precipices above were tumbling down in colossal fragments upon my head.

It is not easy to determine how far an individual might advance between the sheet of water and the rock; but were it even possible to explore the recess to its utmost extremity, scarcely any one, I believe, would have courage to attempt an expedition of the kind.

A little way below the Great Fall, the river is, comparatively speaking, so tranquil that a ferry-boat plies between the Canada and American shores, for the convenience of travellers. When I first crossed, the heaving flood tossed about the skiff with a violence that seemed very alarming; but as soon as we gained the middle of the river, my attention was altogether engaged by the surpassing grandeur of the scene before me. I was now within the area of a semicircle of cataracts, more than three thousand feet in extent, and floated on the surface of a gulf, raging, fathomless, and interminable. Majestic cliffs, splendid rainbows, lofty trees, and columns of spray, were the gorgeous decorations of this theatre of wonders, while a dazzling sun shed refulgent glories upon every spot of the scene. Surrounded with clouds of vapour, and stunned into a state of confusion and terror by the hideous noise, I looked upwards to the height of one hundred feet, and saw vast floods, dense, awful, and stupendous, vehemently bursting over the precipice, and rolling down, as if the windows of heaven were opened to pour another deluge upon the earth. Loud sounds, resembling discharges of artillery or volcanic explosions, were now distinguishable amidst the watery tumult, and added terrors to the abyss from which they issued. The sun, looking majestically through the ascending spray, was encircled by a radient halo; while fragments of rainbows floated on every side, and momentarily vanished only to give place to a succession of others more brilliant. Looking backwards, I saw the Niagara river, again become calm and tranquil, rolling magnificently between the towering cliffs that rose on either side, and receiving showers of orient drew-drops from the trees that gracefully overarched its transparent bossom. A gentle breeze ruffled the waters, and beautiful birds fluttered around, as if to welcome its egress from those clouds and thunders and rainbows, which were the heralds of its precipitation into the abyss of the cataract. HOWISON.

## LESSON XX.

### SCENERY OF THE UPPER ORONOKO.

To take in at one view the grand character of these stupendous scenes, the spectator must be stationed on the little mountain of Manimi, a granitic ridge that rises from the Savannah north of the church of the mission, and is itself only a continuation of the steps of which the cataract of Manimi is composed. We often visited this mountain, for we were never weary of the view of this astonishing spectacle, concealed in one of the most remote corners of the earth. Arrived at the summit of the rock, the eye suddenly takes in a sheet of foam extending a whole mile. Enormous masses of stone, black as iron, issue from its bosom. Some are paps grouped in pairs, like basaltic hills ; others resemble towers, strong castles, and ruined buildings. Their gloomy tint contrasts with the silvery splendour of the foam. Every rock, every islet, is covered with vigorous trees, collected in clusters. At the foot of those paps, far as the eye can reach, a thick vapour is suspended over the river, and through this whitish fog the tops of the lofty palm-trees shoot up. This majestic plant, the trunk of which is more than eighty feet high, has a leafy plumage of a brilliant lustre, which rises almost straight towards the sky. At every hour of the day, the sheet of foam displays different aspects. Sometimes the hilly islands and the palm-trees project their shadows; sometimes the rays of the setting sun are reflected in the humid cloud that shrouds the cataract. Coloured arcs are formed, and vanish, and appear again alternately; light sport of the air, their images wave above the plain. Such is the character of the landscape discovered from the top of the mountain Manimi. I do not hesitate to repeat, that neither time, nor the view of the Cordilleras, nor my abode in the temperate valleys of Mexico, have effaced from my mind the powerful impression of the aspect of the cataracts. When I read a description of those places in India that are embellished by running waters and a vigorous vegetation, my imagination retraces a sea of foam, and palm-trees, the tops of which rise above a stratum of vapour. The majestic scenes of nature, like the sublime works of poetry and the arts, leave remembrances that are incessantly awakening, and through the whole of life mingle with all our feelings of what is grand and beautiful. The calm of the atmosphere, and the tumultuous movement of the waters, produce a contrast peculiar to this zone. Hence no breath of wind ever agitates the foliage, no cloud veils the splendour of the azure vault of heaven; a great mass of light is diffused in the air; on the earth, strewn with plants, with glossy leaves, and on the bed of the river, which extends as far as the eye can reach. This appearance surprises a traveller born in the north of Europe. The idea of wild scenery— of a torrent rushing from rock to rock—is linked in his imagination with that of a climate where the noise of the tempest is mingled with the sound of the cataracts; and where, in a gloomy and misty day, the sweeping clouds seem to descend into the valley, and rest upon the tops of the pines. The landscape of the tropics in the low regions of the continent has a peculiar physiognomy; something of greatness and repose, which it preserves even when one of the elements is struggling with invincible obstacles. Near the equator, hurricanes and tempests belong to islands only, to deserts destitute of plants, and those spots where parts of the atmosphere repose upon surfaces from which the radiation of heat is very different.

HUMBOLDT.

## LESSON XXI.

### CANADA—PERU—CHILI.

CANADA.—The air of Canada is very cold, if compared with its distance from the equator. Its situation is farther removed from the pole than that of Great Britain; yet its winters are much longer and more severe. The climate of Lower Canada, however, has been observed to be rapidly ameliorating, and it has been ascertained that the medium cold in winter has lost eight degrees of its former severity in the neighbourhood of Quebec. The St. Lawrence also is nearly a month later in being shut up than when Canada was first settled. They know little in Canada of spring; summer immediately succeeds the winter with a quick and luxuriant vegetation; and in midsummer the heats are little less intense than the cold in winter.

Peru.—Peru may be said to have four climates, namely—that of the Coast, or Low Peru, constantly dry and temperate; that of the Sierras, mild, moderately humid and variable; that of the Andes, piercing cold; and that of the Pampas, warm and excessively humid. The excessive humidity of these latter, joined with the immense tract of country watered by the Maranon and its subsidiary streams, contributes to render the Maranon such a mighty river.

The Peruvians, like the Mexicans, are copper coloured· According to Humboldt, this colour is peculiar to the whole American races, from Labrador to the Straits of Magellan; and climate, he affirms, to have no perceptible influence on their complexion: some tribes may be darker than others, but this is independent of climate. The natives of the Rio Negro are darker than those of the Lower Oronoko, though they enjoy a much cooler temperature. Near the source of the Oronoko, there are tribes of a very light complexion, surrounded by other tribes much swarthier. The Indians of Chili, and on the tops of the Andes, are as dark as the inhabitants of the plains; though the former are clothed, and the latter go almost naked, and those parts of the body which are constantly covered are as dark as those which are constantly uncovered. The Mexicans are darker than the natives of Quito; and those who live near the Rio Gila are swarthier than those of Guatimala.

Chili.—The climate of Chili is delightful and salubrious; and the four seasons are as regular as in Europe, though in an inversed order, being in the southern hemisphere. Spring commences on the 21st of September:

summer, on the 21st of December; and winter on the summer solstice, or 21st of June. From the commencement of spring, to the middle of autumn, the sky is constantly serene between 24° and 36° S. lat., it being rare that rain falls during that period. The rains begin in the middle of April, and continue, with greater or less intervals, till the end of August. Little rain falls in the northern provinces; there are three or four days' rain alternating with fifteen or twenty dry days; in the southern provinces, the rain sometimes continues, nine or ten days uninterruptedly. In the northern provinces, the comparative want of rain is compensated by very copious dews. Snow, except on the Andes, is very uncommon; it is entirely unknown on the coast, and though it sometimes falls in the middle districts; it often melts ere it reaches the ground, and is seldom known to lie above one day. On the Andes, however, from April to November—which is the rainy season on the plains—snow falls so abundantly, as to render the passes wholly impracticable for the greater part of the year. No river is ever frozen in Chili. Thunder is unknown, except amid the Andes.

BELL'S *Geography*.

## LESSON XXII.

### THE LLANOS, OR PLAINS OF SOUTH AMERICA.

There is something awful, but sad and gloomy, in the uniform aspect of these steppes. Everything seems motionless. Scarcely does a small cloud, passing across the zenith, cast its shadow on the savanna. I know not whether the first aspect of the *llanos* excites less astonishment than that of the Andes. Mountainous countries, whatever may be the absolute elevation of the highest summits, have an analogous physiognomy; but we accustom ourselves with difficulty to the view of the *Llanos* of Venezuela and Casanara, the *Pampas* of Buenos Ayres, and Chaco, which continually recal to mind, during journeys of 20 or 30 days, the smooth surface of the ocean. I had seen the plains of La Mancha in Spain, and the real steppes that extend from Jutland, through Lunenberg and Westphalia, to Belgium; but the plains of the west and north of Europe present but a feeble image of the immense *llanos* of South America. All around us, the plains seemed to ascend towards the sky; and that vast and profound solitude appeared like an ocean covered with sea-weeds. According to the unequal mass of vapours diffused through the atmosphere, and the various temperatures of the different strata of air, the horizon was in some parts clear and distinct; in other parts, undulating, sinuous, and as if striped. The earth was there confounded with the sky. Through the dry fog and strata of vapour, the trunks of palm-trees were discerned at a great distance. Stripped of their foliage and their verdant tops, these trunks appear like the masts of ships discovered at the horizon.

The *Llanos* and the *Pampas* of South America are real steppes. They display a beautiful verdure in the rainy season, but in the time of great drought assume the aspect of a desert. The grass is then reduced to powder, the earth cracks, the alligator and the great serpent remain buried in the dried mud, till awakened from their long lethargy by the first showers of spring. These phenomena are observed on barren tracts of 50 or 60 leagues in length, wherever the savannas are not traversed by rivers; for, on the borders of rivulets, and around little pools of stagnant water, the traveller finds at certain distances, even during the period of the great droughts, thickets of mauritia—a palm the leaves of which spread out like a fan—preserve a brilliant verdure.

The chief characteristic of the savannas or steppes, of South America, is the absolute want of hills and inequalities—the perfect level of every part of the soil. Accordingly, the Spanish conquerors, who first penetrated from Coro to the banks of the Apure, did not call them deserts, or savannas, or meadows, but plains, *llanos*. Often, in a space of 30 square leagues, there is not an eminence of a foot high. This resemblance to the surface of the sea strikes the imagination most powerfully, where the plains are altogether destitute of palm trees, and where the mountains of the shore and of the Oronoco are so distant that they cannot be seen. A person would be tempted there to take the altitude of the sun with a quadrant, if the *horizon of the land* were not constantly misty, on account of variable display of refraction.

## LESSON XXIII

### SCENERY OF THE APURE.

If we were surprised, delighted, and sometimes intimidated, by our near approach to the various creatures both by land and water; if we gazed with admiration on the beautiful plumage of the birds as we passed up the Oronoco, how much wonder, astonishment, and even terror, joined with a certain degree of pleasure, did we experience at seeing the inhabitants on the Apure increasing, as it were, an hundred fold in numerical proportion to what we had before seen or imagined; I should dread to describe what I saw and heard, were it not that all my companions could vouch for my accuracy. Crocodiles, fourteen and sixteen feet long, were basking on the sedges near the banks of the river in groups of six or eight; every minute others were seen floating down the stream, many of which the men struck with the oars of the boat, and others were apparently wounded with ball, fired from pistols or muskets, but none materially injured. Tigers of a very large size were visible on the sands, and a larger animal once, which men conceived to be a lion, but which was probably a variety of the leopard, as the king of the forest is unknown in this clime.

The numerous flocks of birds, flying from side to side of the river, and passing over our heads, were almost too many to count, and some of the flocks so prodigious, as absolutely to shade, during the interval of their passage, the rays of the sun from our flechera. The shores of the river were lined with every sort of marine and tropical birds: all of which, as if unconscious of the approach or power of man, suffered us to look at, and pass them unheeded, from the large pelican down to the smallest genus of the crane. Here the flamingo was seen in all its stateliness and grandeur. The crown-crane was also perceptible, and a bird of the same genus as the crane, although far more elegant and beautiful in symmetry and appearance, which I had frequently seen in South Africa, where it is called the secretary. What with birds, beasts, amphibious animals, fish, and reptiles, the eye was at length tired with the everlasting succession, and the mind could wonder no longer. The mocking-bird, a native of these immense forests, gave me a most decisive proof of its powers of utterance, and its capability of articulating two or more syllables, with such clearness of sound and expression as to astonish all who heard it. To none of the parrot tribe do I yield a preference; nor did I ever hear one of them repeat words, and pronounce them so distinctly as to create a doubt whether or not they were uttered by the voice of man.

On ascending the Apure, our people had, as usual, landed to cook their suppers, and to prepare food for consumption on the following day. The night had been wholly spent on shore by both officers and men. The hammock on which I slept was suspended between two large trees, at some height from the ground, and to windward of the fires. At day-light, when I awoke, having occasion to speak to one of the officers, and not seeing him near me, I called aloud on his name. I called a second time, when I was told he was gone down to our boat. In a few seconds after I heard a voice, similar to my own, repeating equally loud, "Denis! Denis! Denis! Denis!" with the usual pause between. This call Captain Denis himself distinctly heard, thought it mine, and answered that he would be with me directly; and, from the constant repetition, he imagined that the nature of my business must be urgent, and hurried himself accordingly. Several of the non-commissioned officers, who also heard the call, directed others to "pass the word for Captain Denis, as the colonel wanted him." Our eyes and ears being at length directed to the spot, we discovered that my obliging, attentive, and repeating friend was sitting in the form of a bird on the upper branch of a small tree near me, from whence he soon took his flight, making the very woods resound with the name of Denis.

Hippisley's *Narrative.*

## LESSON XXIV.

### ON STAFFA.

————————The thin mist rolls away,
Bright glows the wave beneath the dancing ray,
And Staffa's thousand columns seem to leap
From ocean's breast—a temple of the deep,
As if e'en now some wizard's demon hand
Had bade each pillar rise, each arch expand—
Raised by his spell, behold, yon wondrous cave
Has bridged with hollow span the pathless wave,
And bidding proud defiance to the sea,
The wall has heaved its untaught masonry!

Stern in thy beauty! Nature's warmer smile,
Beams not for thee, thou rude and lonely Isle;
No twining lichen wreathes thy sullen crest,
No wild-flower blossoms from thy rocky breast,
No waving foliage woos the summer gale,
No streamlet lends its freshness to the vale;
But o'er each whitened cliff, the wintry blast
Has howled, for aye, in fury as it pass'd.
Yet art thou beauteous! o'er the earth and sea,
Where is that spot which shall compare with thee?
Thy mystic hall, which stands as erst it stood,
When through its arches swept the awaken'd flood;
Thy columns' clustering form, whose every part
Seems built in Nature's mockery of art.
O! may not fancy prompt the pleasing dream.
That Genius stole from thee his earliest theme?
To thee we owe each once monastic pile,
To thee the dim cathedral's Gothic aisle;
From thy primeval architecture rose
Each laboured charm that science still bestows.
O! what a temple for the heart to rise
Elate on glad communion with the skies;
No altar built with hands, no dome supplied,
The costly gift of penitence or pride—
No laboured strain to prompt the lingering soul,
And urge it onward to the heavenly goal—
But the wild music of the measured wave,
That speeds its greeting to the thirsty cave,
And each unchiselled stone, whose front sublime
Has frowned in triumph o'er the stroke of time.

*Blackwood's Magazine.*

## LESSON XXV.

### ADDRESS TO THE MUMMY IN BELZONI'S EXHIBITION.

And thou hast walked about (how strange a story !)
In Thebes' streets three thousand years ago,
When the Memnonium was in all its glory,
And time had not begun to overthrow
Those temples, palaces, and piles stupendous,
Of which the very ruins are tremendous.

Speak! for thou long enough hast acted dummy,
Thou hast a tongue—come let us hear its tune ;
Thou'rt standing on thy legs, above ground, Mummy
Revisiting the glimpses of the moon,
Not like thin ghosts or disembodied creatures,
But with thy bones and flesh, and limbs and features.

Tell us—for doubtless thou canst recollect—
To whom should we assign the Sphinx's fame ?
Was Cheops or Cephrenes architect
Of either Pyramid that bears his name ?
Is Pompey's pillar really a misnomer ?
Had Thebes a hundred gates as sung by Homer ?

Perchance that very hand, now pinioned flat,
Has hob-a-nobb'd with Pharaoh glass to glass ;
Or dropp'd a half-penny in Homer's hat,
Or doffed thine own to let Queen Dido pass,
Or held, by Solomon's own invitation,
A torch at the great temple's dedication.

I need not ask thee if that hand, when arm'd,
  Has any Roman soldier mauled and knuckled,
For thou wert dead and buried and embalm'd,
  Ere Romulus and Remus had been suckled:—
Antiquity appears to have begun
Long after thy primeval race was run.

Since first thy form was in this box extended,
  We have, above ground, seen some strange mutations;
The Roman Empire has begun and ended,
  New worlds have risen—we have lost old nations,
And countless kings have into dust been humbled,
While not a fragment of thy flesh has crumbled.

Didst thou not hear the pother o'er thy head,
  When the great Persian conqueror, Cambyses,
Marched armies o'er thy tomb with thundering tread,
  O'erthrew Osiris, Orus, Apis, Isis,
And shook the Pyramids with fear and wonder,
When the gigantic Memnon fell asunder?

If the tomb's secrets may not be confess'd,
  The nature of thy private life unfold:—
A heart has throbbed beneath that leathern breast,
  And tears adown that dusky cheek have rolled:—
Have children climbed those knees and kissed that face?
What was thy name and station, age and race?

Statue of flesh—immortal of the dead!
  Imperishable type of evanescence!
Posthumous man, who quitt'st thy narrow bed,
  And standest undecayed within our presence,

Thou wilt hear nothing till the judgment morning,
When the great trump shall thrill thee with its warning.

Why should this worthless tegument endure,
If its undying guest be lost for ever?
O! let us keep the soul embalmed and pure
In living virtue, that when both must sever,
Although corruption may our frame consume,
The immortal spirit in the skies may bloom.

*New Monthly Magazine.*

## LESSON XXVI.

### JERUSALEM.

Fallen is thy throne, O Israel!
Silence is o'er thy plains;
Thy dwellings all lie desolate,
Thy children weep in chains.
Where are the dews that fed thee
On Etham's barren shore?
That fire from heaven that led thee
Now lights thy path no more!

Lord, thou didst love Jerusalem;
Once she was all thine own:
Her love thy fairest heritage

Till evil came and blighted
  Thy long-loved olive tree,
And Salem's shrines were lighted
  For other gods than thee,

Then sank the star of Solyma,
  Then passed her glory's day,
Like heath that in the wilderness
  The light wind whirls away.
Silent and waste her bowers,
  Where once the mighty trode;
And sunk those guilty towers
  Where Baal reigned as God.

"Go," said the Lord, "ye conquerors,
  Steep in her blood your swords,
And raze to earth her battlements,
  For they are not the Lord's.
Tell Zion's mournful daughter
  O'er kindred bones she'll tread,
And Hinnom's vale of slaughter
  Shall hide but half her dead."

But soon shall other pictured scenes
  In brighter vision rise,
When Zion's sun shall sevenfold shine
  On all her mourners' eyes;
And on her mountains beauteous stand
  The messengers of peace;
"Salvation by the Lord's right hand,"
  They shout and never cease.

**Moore.**

## LESSON XXVII.

### THE FALLS OF NIAGARA.

The thoughts are strange that crowd into my brain
When I look upward to thee. It would seem
As if God poured thee from his "hollow hand,
And hung his bow upon thine awful front;
And spoke in that loud voice, which seemed to him
Who dwelt in Patmos for his Saviour's sake,
"The sound of many waters;" and had bade
Thy flood to chronicle the ages back,
And notch His cent'ries in the eternal rocks.
Deep calleth unto deep. And what are we,
That hear the question of that voice sublime?
Oh! what are all the notes that ever rung
From war's vain trumpet, by thy thundering side
Yea, what is all the riot that man makes
In his short life, to thy unceasing roar!
And yet, bold babbler, what art thou to Him,
Who drowned a world, and heaped the waters far
Above its loftiest mountains?—a light wave,
That breaks, and whispers of its Maker's might.

Brainard

## LESSON XXVIII.

### ON THE DOWNFALL OF POLAND.

Oh! sacred Truth, thy triumph ceased awhile,
And Hope, thy sister, ceased with thee to smile,
When leagued Oppression poured to northern wars
Her whiskered pandoors and her fierce hussars,

Waved her dread standard to the breeze of morn,
Pealed her loud drum, and twanged her trumpet-horn :
Tumultuous horror brooded o'er her van ;
Presaging wrath to Poland—and to man !
Warsaw's last champion from her height surveyed
Wide o'er the fields a waste of ruin laid,—
Oh ! Heav'n, he cried,—my bleeding country save !
Is there no hand on high to shield the brave .
Yet, though destruction sweep those lovely plains,
Rise, fellow-men ! our country yet remains!
By that dread name we wave the sword on high !
And sweet for her to live !—with her to die !

He said, and on the rampart-heights arrayed
His trusty warriors, few, but undismayed ;
Firm-paced and slow a horrid front they form,
Still as the breeze, but dreadful as the storm ;
Low, murm'ring sounds along their banners fly,
Revenge or death.—the watchword and reply.
Then pealed the notes, omnipotent to charm,
And the loud tocsin tolled their last alarm ;

In vain alas! in vain, ye gallant few !
From rank to rank your volley'd thunder flew :—
Oh ! bloodiest picture in the book of time,
Sarmatia fell, unwept, without a crime,
Found not a generous friend, a pitying foe,
Strength in her arms, nor mercy in her woe !
Dropp'd from her nerveless grasp the shattered spear,
Closed her bright age, and curb'd her high career :
Hope, for a season, bade the world farewell,
And Freedom shrieked—as KOSCIUSKO fell !

The sun went down, nor ceased the carnage there;
Tumultuous murder shook the midnight air—
On Prague's proud arch the fires of ruin glow,
His blood-dyed waters murmuring below;
The storm prevails, the rampart yields away,
Bursts the wild cry of horror and dismay!
Hark ? as the smouldering piles with thunder fall,
A thousand shrieks for hopeless mercy call!
Earth shook—red meteors flashed along the sky,
And conscious Nature shuddered at the cry!

Departed spirits of the mighty dead!
Ye that at Marathon and Leuctra bled!
Friends of the world! restore your swords to man,
Fight in his sacred cause and lead the van!
Yet for Sarmatia's tears of blood atone,
And make her arm puissant as your own!
Oh! once again to Freedom's cause return
The patriot TELL—the BRUCE of BANNCCKBURN.

CAMBELL.

## LESSON XXX.

### POMPEII.

The shroud of years thrown back, thou dost revive,
Half-raised, half-buried, dead, yet still alive!
Gathering the world around thee, to admire
Thy disinterment, and with hearts on fire,
To catch the form and fashion of the time
When Pliny lived and thou wert in thy prime.
So strange thy resurrection, it may seem
Less waking life than a distressful dream.

Hush'd in this once gay scene, nor murmurs more
The city's din, the crowd's tumultuous roar,
The laugh convivial, and the chiming sound
Of golden goblets with Falernian crown'd;
The mellow breathings of the Lydian flute,
And the drip of fountains, as they shoot
From marble basements, these, all these are mute!
Closed are the springs, unnumbered fathoms deep,
Her splendid domes are one dismantled heap,
Her temples soil'd, her statues in the dust,
Her tarnish medals long devoured by rust;
Its rainbow-pavements broken from the bath,
The once throng'd Forum—an untrodden path;
The fanes of love—forgotten cells; the shrines
Of vaunted gods—inurned in sulphur mines;
The abodes of arts, of luxury, and taste—
Tombs of their once glad residents—a waste,
O'er which compassionate years have gradual thrown
The trailing vine, and bid the myrtle moan.

*Lyrical Gems.*

## LESSON XXX.

### THUNDER-STORM AMONG THE ALPS.

The sky is changed! and such a change!—Oh night,
And storm and darkness, ye are wondrous strong,
Yet lovely in your strength, as is the light
Of a dark eye in woman! Far along
From peak to peak, the rattling crags among,

Leaps the live thunder! Not from one lone cloud,
But every mountain now hath found a tongue,
And Jura answers, through her misty shroud,
Back to the joyous Alps, who call to her aloud!

And this is in the night:—most glorious night
Thou wert not sent for slumber! let me be
A sharer in thy fierce and far delight—
A portion of the tempest and of thee!
How the lit lake shines, a phosphoric sea,
And the big rain comes dancing to the earth!
And now again 'tis back—and now the glee
Of the loud hills shake with its mountain mirth,
As if they did rejoice o'er a young earthquake's birth.

BYRON.

## LESSON XXXI.

### A VOYAGE ROUND THE WORLD.

Emblem of eternity,
Unbeginning endless sea!
Let me launch my soul on thee,
Sail, nor keel, nor helm, nor oar,
Need I, ask I, to explore
Thine expanse from shore to shore.

Eager fancy, unconfined
In a voyage of the mind,
Sweeps along thee like the wind.
Where the billows cease to roll,
Round the silence of the pole,
Thence set out, my venturous soul!

See, by Greenland cold and wild,
Rocks of ice eternal piled;
Yet the mother loves her child,
  Next on lonely Labrador,
  Let me hear the snow-falls roar,
  Devastating all before.

But a brighter vision breaks
O'er Canadian woods and lakes;
——These my spirit soon forsakes.
  Land of exiled Liberty,
  Where our fathers once were free,
  Brave New England, hail to thee!

Pennsylvania, while thy flood
Waters fields unbought with blood,
Stand for peace as thou hast stood.
  The West Indies I behold,
  Like the Hesperides of old,
  ——Trees of life, with fruits of gold!

No—a curse is on the soil:
Bonds and scourges, tears and toil,
Man degrade, and earth despoil.
  Horror-struck I turn away,
  Coasting down the Mexique bay;
  Slavery there hath lost the day.

South America expands
Mountain-forests, river-lands,
  And a nobler race arise,
  Stretch their limbs, unclose their eyes,
  Claim the earth, and seek the skies.

Gliding through Magellan's straits,
Where two oceans ope their gates,
What a spectacle awaits!
The immense Pacific smiles
Round ten thousand little isles,
——Haunts of violence and wiles.

But the powers of darkness yield,
For the Cross is in the field,
And the light of life reveal'd:
Rays from rock to rock it darts,
Conquers adamantine hearts,
And immortal bliss imparts.

North and west, receding far
From the evening's downward star,
Now I mount Aurora's car,—
Pale Siberia's deserts shun,
From Kamschatka's headlands run,
South and east, to meet the sun.

Jealous China, strange Japan,
With bewildered thought I scan:
——They are but dead seas of man.
Lo! the eastern Cyclades,
Phœnix-nests, and halcyon seas;
But I tarry not with these.

Pass we now New Holland's shoals,
Where no ample river rolls;
——World of undiscover'd souls!
Bring them forth;—'tis Heaven's decree,
Man, assert thy dignity;
Let not brutes look down on thee.

Either India next is seen,
With the Ganges stretch'd between
Ah ! what horrors here have been.
War, disguised as commerce, came ;
Britain, carrying sword and flame,
Won an empire,—lost her name.

By the gulf of Persia sail,
Where the true-love nightingale
Woos the rose in every vale.
Though Arabia charge the breeze
With the incense of her trees,
On I press o'er southern seas.

Cape of Storms, the sceptre's fled,
And the angel Hope, instead,
Lights from heaven upon thy head.
St. Helena's dungeon keep
Scowls defiance o'er the deep ;
There Napoleon's relics sleep.

Mammon's plague-ships throng the waves ;
Oh ! 'twere mercy to the slaves,
Were the maws of sharks their graves.
Hercules, thy pillars stand,
Sentinels of sea and land ;
Cloud-capt Atlas towers at hand.

Mark the dens of caitiff Moors ;
Ah ! the pirates seize their oars ;
—— Fly the desecrated shores.
Egypt's hieroglyphic realm,
Other floods than Nile's o'erwhelm ;
—— Slaves turn'd despots hold the helm.

Judah's cities are forlorn,
Lebanon and Carmel shorn,
Zion trampled down with scorn.
  Greece, thine ancient lamp is spent;
  Thou art thine own monument;
  But the sepulchre is rent.

And a wind is on the wing
At whose breath new heroes spring,
Sages teach, and poets sing.
  Italy, thy beauties shroud
  In a gorgeous evening cloud;
  Thy refulgent head is bow'd:

Yet where Roman genius reigns,
Roman blood must warm the veins;
—— Look well, tyrants, to your chains.
  Feudal realm of old romance,
  Spain, thy lofty front advance,
  Grasp thy shield and couch thy lance.

At the fire-flash of thine eye,
Giant bigotry shall fly;
At thy voice, oppression die.
  Lusitania, from the dust
  Shake thy locks; thy cause is just;
  Strike for freedoom, strike and trust.

France I hurry from thy shore:
Thou art not the France of yore;
Thou art new-born France no more.
  Sweep by Holland like the blast:
  One quick glance at Denmark cast,
  Sweden, Russia;—all is past.

Elbe nor Weser tempt my stay;
Germany, beware the day
When the schoolmen bear the sway.
  Now to thee, to thee I fly,
  Fairest isle beneath the sky
  To mine heart as in mine eye!

I have seen them one by one,
Every shore beneath the sun,
And my voyage now is done.
  While I bid them all be blest;
  Britain thou 'rt my home, my rest:
  —My own land I love *thee* best.

MONTGOMERY.

## LESSON XXXII.

### DETACHED PIECES.

———Etna roars with dreadful ruins nigh,
Now hurls a bursting cloud of cinders high,
Involved in smoky whirlwinds to the sky;
With loud displosion, to the starry frame
Shoots fiery globes, and furious floods of flame:
Now from the bellowing caverns burst away
Vast fields of melted rocks in open day.
Her shatter'd entrails wide the mountain throws,
And deep below her flaming centre glows.

**WARTON.**

———The liquid lake that works below,
Bitumen, sulphur, salt, and iron scum,
Heaves up its boiling tide. The labouring mount
Is torn with agonizing throes. At once,
Forth from its side disparted, blazing pours
A mighty river, burning in prone waves
That glimmer thro' the night, to yonder plain.
Divided there, a hundred torrent-streams,
Each ploughing up its bed, look dreadful on,
Resistless. Villages, and woods, and rocks,
Fall flat before their sweep. The region round,
Where myrtle-walks and groves of golden fruit
Rose fair; where harvest waved in all its pride;
And where the vineyard spread its purple store,
Maturing into nectar; now despoiled
Of herb, leaf, fruit and flower, from end to end
Lies buried under fire, a glowing sea!

MALLET.

—— When mid the lifeless summits proud
Of Alpine cliffs, where to the gelid sky
Snows piled on snows in wintry torpor lie,
The rays divine of vernal Phœbus play;
Th' awakened heaps, in streamlets from on high,
Roused into action, lively leap away,
Glad warbling through the vales, in their new being gay.

THOMSON.

Who first beholds the Alps—that mighty chain
Of mountains, stretching on from east to west,
So massive, yet so shadowy, so ethĕreal,

As to belong rather to heaven than earth,
But instantly receives into his soul
A sense, a feeling that he loses not,
A something that informs him 'tis a moment
Whence he may date henceforward and for ever.
Rogers.

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Now o'er their head the whizzing whirlwinds breathe,
And the live desert pants, and heaves beneath ;
Tinged by the crimson sun, vast columns rise
Of eddying sands, and war amid the skies,
In red arcades the billowy plain surround,
And stalking turrets dance upon the ground.
Darwin.

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——————Now gentle gales,
Fanning their odorif'rous wings, dispense
Native perfumes, and whisper whence they stole
Those balmy spoils: as when to them who sail
Beyond the Cape of Hope, and now are past
Mozambic, off at sea north-east winds blow
Sabean odours, from the spicy shore
Of Araby the bless'd, with such delay
Well pleased, they slack their course, and many a league,
Cheer'd with the grateful smell old Ocean smiles.
Milton.

# SECTION III.

## LESSON I.

### THE JOURNEYING OF THE ISRAELITES.

A year and a month after the departure of the twelve tribes from Egypt, they broke up their encampment in the elevated region about Mount Sinai. The nation assumed the appearance of a regular army; military order and discipline were established; and each tribe marched in succession under its own leaders, with its banner displayed, and took up its position in the appointed quarter of the camp. The whole number of fighting men was 603,555. This formidable army set forward singing, "*Let God arise, and let his enemies be scattered!*" and thus, already furnished with their code of laws, and irresistible both in their numbers, and in the promised assistance of God, they marched onward to take possession of the fruitful land, which had been promised to their fathers. The pillar of fire still led the way by night, and the pillar of cloud by day; but Moses likewise secured the assistance of Hobab, his brother-in-law, who had been accustomed to traverse the desert, and knew intimately the bearings of the country, the usual resting-places, the water-springs and the character and habits of the wandering tribes.

Their march was not uninterrupted by adventures, most of which were occasioned by their own seditious murmurings; but at length they arrived at the southern frontier of the promised land, at a place called Kadesh Barnea. Their wanderings are now drawing to an end, and they are to reap the reward of all their toil and suffering, the final testimony of the divine favour. Twelve spies, one from each tribe, are sent out to make observations on the fruitfulness of the country, the character of the inhabitants, and the strength of their fortifications. Among these the most distinguished are Caleb, of the tribe of Judah, and Joshua, of Ephraim. During the forty days of their absence the assembled people anxiously await their return; and at length they are seen advancing towards the camp, loaded with delicious fruits, for it was now about the time of the vintage.

In one respect their report is most satisfactory: Canaan had undergone great improvement since the time when Abraham and Jacob had pastured their flocks in the open and unoccupied plains. The vine, the olive, the pomegranate, and the fig, were cultivated with great success; and the rich sample which they bear (a bunch of grapes, almost as much as two men could carry, suspended from a pole, with figs and pomegranates,) confirms their cheering narrative.

But, at the same time, they bring intelligence which overwhelms the whole people with terror. These treasures were guarded by fierce and warlike tribes, not likely to abandon their native plains without an obstinate and bloody contest. Their cities were strongly fortified; and, above all, nearly the first enemies they would have to encounter would be men of colossal stature, the descendants of the gigantic people, celebrated in their early national tradition, a people before whom they would be *as* *grasshoppers*. The inhabitants of Egypt are in general of small stature; and the same causes which tended to the rapid increase of the Jewish people in that country, were unfavourable to their height and vigour. But, worse than this, their long slavery had debased their minds: their confidence in the divine protection gave way at once before their sense of physical inferiority, and the total deficiency of moral courage. "*Back to Egypt*" is the general cry. Joshua and Caleb in vain reprove their pusillanimity, and want of faith in the promises of God. Moses therefore is instructed by God to inform the people that, on account of their murmurings, all who left the land of Egypt should perish in the wilderness, save only Joshua and Caleb. He therefore commands them, on the authority of God, to retreat directly from the borders of the promised land. They are neither to return to Egypt, nor to assail an easier conquest; but they are condemned to wander for a definite period of forty years in barren and dismal regions through which they had marched. No hope is held out that their lives shall be prolonged; they are distinctly assured that not one of them shall receive those blessings, on the promise of which they had surrendered themselves to the guidance of Moses, abandoned Egypt, and traversed the wilderness.

Of the Hebrew history during the succeeding thirty-eight years passed in the desert, nothing is known except the names of their stations. But during that period they were undergoing a course of discipline, which fitted them for achieving the conquest from which they had formerly shrunk. When the former generation, therefore, had gradually sunk into the grave, and a new race had sprung up, trained to the bold and hardy habits of the wandering Arab; when the free air of the desert had invigorated their frames, and the canker of slavery had worn out of their minds; and when continued miraculous support for so many years had strengthened their faith in the assistance of God, the Hebrew nation again suddenly appeared at Kadesh, the same point on the southern frontier of Palestine from which they had retreated. At this point Miriam died, and was buried with great honour. The whole camp was distressed for the want of water, and was again miraculously supplied. Here likewise Moses himself betrayed his mistrust in the divine assistance, and the final sentence was issued, that he should not lead the nation into the possession of the promised land. Many formidable difficulties opposed their penetrating into Canaan on this frontier. They were therefore directed to make a circuit; to pass round the Dead Sea, and crossing the Jordan, to proceed at once into the heart of the richest and least defensible part of the country. Before they commenced this march Aaron died, and was buried on Mount Hor. As the Edomites refused to let them pass through the defiles in the mountains, they were forced to march southward along the valley, now called El Araba, and turn the ridge where it is very low, close to the branch of the Red Sea. It was at this period that they were infested by fiery serpents, of the biting of which they were cured by steadfastly gazing on a serpent of brass erected at the command of God by Moses. At length, notwithstanding the opposition of the Moabites, Midianites, and Amorites, aided by the divinations of Balaam, they drew near the termination of their wanderings. But the triumph of the people was to be preceded by the death of the lawgiver. He was to behold, not to enter the promised land. Once he had sinned for want of confidence in the divine assistance, and the penalty affixed to his offence was now exacted. As his end approached, he summoned the assembly of all Israel to receive his final instructions. He recounted their whole eventful history since their deliverance, their toils, their dangers, their triumphs. He recapitulated and consolidated in one brief Code, the book of Deuteronomy, the whole law, in some degree modified and adapted to the future circumstances of the republic. He then appointed a solemn ratification of this covenant with God, to be made as soon as they were in possession of the country which now lay before them. And, finally having enlarged on the blessings of obedience; having, with dark and melancholy foreboding of the final destiny of the people, laid before them still more at length the consequences of apostacy and wickedness; and having enriched the national poetry with an ode worthy of him who composed the Hymn of Triumph by the Red Sea, Moses was directed to ascend the loftiest eminence in the neighbourhood, in order that he might once behold, before his eyes were closed for ever, the land of promise. From the top of Mount Abarim, or Nebo, the lawgiver, whose eyes were not dimmed, and who had suffered none of the infirmities of age, might survey a large tract of country. To the right, lay the mountain pastures of Gilead, and the romantic district of Bashan; the windings of the Jordan might be traced along its broad and level valley, till, almost beneath his feet, it flowed into the

Dead Sea. To the north spread the luxuriant plains of Esdraelon, and the more hilly yet fruitful country of Lower Galilee. Right opposite stood the city of Jericho, embowered in its groves of palms; beyond it the mountains of Judæa, rising above each other till they reached the sea. Gazing on this magnificent prospect, and beholding in prophetic anticipation his great and happy commonwealth occupying its numerous towns and blooming fields, Moses breathed his last. The place of his burial was unknown, lest, perhaps, the impious gratitude of his followers might ascribe divine honours to his name, and assemble to worship at his sepulchre.

*Abridged from the History of the Jews.*

## LESSON II.

### THE SETTLEMENT OF THE ISRAELITES IN CANAAN.

The extent of that portion of Syria which was granted to the Hebrew nation has been variously estimated; but, assuming that the true boundaries of the promised land were, Mount Libanus on the north, the wilderness of Arabia on the south, and the Syrian desert on the east, it may be computed at about fifteen millions of acres. If this computation be correct, there was in the possession of the Hebrew chiefs land sufficient to allow to every Israelite capable of bearing arms a lot of about twenty acres; reserving for public uses, as also for the cities of the Levites, about one-tenth of the whole. This territory was ordered to be equally divided among their tribes and families, according to their respective numbers; and the persons selected to superintend this national work were, Eleazer, the high priest; Joshua, who acted in the character of judge; and the twelve princes or heads of Israel. The rule which they followed is expressed in these words, "And ye shall divide the land by lot, for an inheritance among your families: and to the more ye shall give the more inheritance, and to the fewer ye shall give the less inheritance: every man's inheritance shall be in the place where his lot falleth; according to the tribes of your fathers ye shall inherit." Every tribe was thus put in possession of a separate district or province, in which all the occupiers of the land were not only Israelites, but more particularly sprung from the same stock, and descendants of the same patriarch. The several families, again, were placed in the same neighbourhood, receiving their inheritance in the same part or subdivision of the tribe. To secure the permanence and mutual independence of every separate tribe, a law was enacted by the authority of heaven, providing that the landed property of every Israelite should be unalienable. Whatever circumstances might befal the owner of a field, and whatever might be the obligations under which he placed himself to his creditor, he was released from all claims at the year of jubilee. "Ye shall hallow," said the inspired legislator, "the fiftieth year, and proclaim liberty throughout all the land unto all the inhabitants thereof. It shall be a jubilee unto you, and ye shall return every man to his possession, and ye shall return every man unto his family. And the land shall not be sold forever; for the land is mine saith the Lord; for ye are strangers and sojourners with me."

The attentive reader of the Mosaical law will observe that, though a Hebrew could not divest himself of his land in perpetuity, he could dispose of it so far as to put another person in possession of it, during a certain number of years; reserving to himself and his relations the right of redeeming it, should they ever possess the means; and having, at all events, the sure prospect of reversion at the period of the jubilee. In the eye of the lawgiver this transaction, was not regarded as a sale of the land, but merely of the crops for a stated number of seasons. It might, indeed, have been considered simply as a lease, had not the owner, as well as his nearest kinsman, enjoyed the privilege of resuming occupation, whenever they could repay the sum for which the temporary use of the land had been purchased. The houses which were built in fields or villages, were, in regard to the principle of alienation, placed on the same footing as the lands themselves; being redeemable at all times, and destined to return to their original owners in the year of jnbilee. But it is worthy of notice, that houses in cities and large towns were, when sold, redeemable only during one year, after which the sale was held binding for ever. There was, indeed, an exception in this case in favour of the Levites, who could, at any time, redeem "the houses of the cities of their possession," and who, moreover, enjoyed the full advantage of the fiftieth year.

The Hebrews, like most other nations in a similar state of society, held their lands on the condition of military service. The grounds of exemption allowed by Moses prove clearly that every man of competent age was bound to bear arms in defence of his country; a conclusion which is at once strikingly illustrated and confirmed by the conduct of the Senate or Heads of the Tribes, in the melancholy war undertaken by them against the children of Benjamin. Upon a muster of the confederated army at Mizpeh, it was discovered that no man had been sent from Jabesh-Gilead to join the camp: whereupon it was immediately resolved that twelve thousand soldiers should be despatched to put all the inhabitants of that town to military execution. "And the congregation commanded them, saying, Go and smite Jabesh-Gilead with the edge of the sword, with the women and children;" and the only reason assigned for this severe order was, that "when the people were numbered, there were none of the men of Jabesh-Gilead there."

Russell—*Cabinet Library.*

## LESSON III.

### THE HEBREW COMMONWEALTH.

In every tribe there was a chief called the Prince of the Tribe, or the Head of Thousands; and under him were the Princes of Families, or Commanders of Hundreds. For example, we find that, at the muster which was made of the Hebrews in the wilderness of Sinai, Nahshon, the son of Amminadab, was prince of the tribe of Judah. This tribe again, like all the others, was divided into several families; the term being used here, not in its ordinary acceptation, to signify a mere household, but rather in the heraldic sense, to denote a lineage or kindred descended from a common ancestor, and constituting one of the main branches of an original stock. It appears, moreover, that a record of these Families, of the households in each, and even of the individuals belonging to every household, was placed in the hands of the chief ruler; for it is related that, on the suspicion excited with regard to the spoils of Jericho and the discomfiture at Ai, "Joshua brought Israel by their tribes, and the tribe of Judah was taken; and he brought the family of Judah, and he took the family of the Zarhites; and he brought the family of the Zarhites, man by man, and Zabdi was taken; and he brought his household, man by man, and Achan, the son of Carmi, the son of Zabdi, the son of Zerah, of the tribe of Judah, was taken."

But the polity established by the Jewish lawgiver was not confined to the constitution and government of the separate tribes. It likewise extended its regulations to the common welfare of the whole, as one kingdom under the special direction of Jehovah; and provided that on all great occasions they should have the means of readily uniting their councils and combining their strength. Even during the less orderly period which immediately followed the settlement of the Hebrews in the land of their inheritance, we find traces of a general government; a national senate, whose deliberations guided the administration of affairs in all cases of difficulty or hazard; judges, raised up on extraordinary emergencies, and invested with a high degree of executive authority as the first magistrates of the commonwealth; and lastly, the controlling voice of the congregation of Israel, whose concurrence appears to have been at all times necessary to give vigour and effect to the resolutions of their leaders. To these constituent parts of the Hebrew government we may add the Oracle or voice of Jehovah, without whose sanction, as revealed by Urim and Thummim, no measure of importance could be adopted either by the council or by the judge.

Provision was, moreover, made by Moses, and established by Joshua, for the due administration of justice throughout the land. "Judges and officers," said the former, "shalt thou make in all thy gates, which the Lord thy God giveth thee; and they shall judge the people with just judgment. Thou shalt not wrest judgment; thou shalt not respect persons, neither take a gift: for a gift doth blind the eyes of the wise, and pervert the words of the righteous." The place where those judges held their audience was the gate of the city; for, as the Israelites were all husbandmen, who went out in the morning to their work, and did not return till the evening, the gate of the city was the place where they most frequently met. The judges took their seats immediately after morning prayers, and continued till the end of the sixth hour, or twelve o'clock; and their authority, though not in capital cases, continued to be respected by the Israelites long after Jerusalem was levelled with the ground.

To this brief account of the political constitution of the ancient Jews may be added some notice of the tribe of Levi, the duties and revenues of which were fixed by peculiar laws, and which, inasmuch as it supplied the whole nation with judges, lawyers, scribes, teachers, and physicians, was in a great variety of its avocations as closely connected with secular life as with the ministry of the tabernacle. We find in the first chapter of the Book of Numbers, a command issued by the authority of Jehovah to separate the tribe now mentioned from the rest of their brethren, and not to enrol them among those who were to engage in war. It was determined, on similar grounds, that the Levites were to have no inheritance in the land, like the other tribes but were to receive, from their kinsmen, in name of maintenance, a tenth part of the gross produce of their fields and vineyards. The occupations for which they were set apart were altogether incompatible with the pursuits of agriculture or the feeding of cattle. It was deemed expedient, therefore, that they should be relieved from the cares and toils connected with the possession of territorial estates, and devote their whole attention to the service of the altar, and the instruction of the people. To effect these wise purposes, it was necessary that the members of this learned body should not be confined to one particular district, but that they should be distributed among all the other tribes, according to the extent of their several inheritances and the amount of their population. With this view, the law provided that forty-eight cities should be set apart for them, together with such a portion of soil as might seem requisite for their comfort and more immediate wants. Every reader of his Bible is aware, that six of these cities were invested with the special right of affording refuge and protection to a certain class of criminals. The man-slayer or he who "killed his neighbour ignorantly" could demand admittance into the cities of refuge, and was entitled to gratuitous lodging and maintenance, until his cause should be determined by competent judges.

As learning and the several professions connected with the knowledge of letters were confined almost exclusively to the tribe of Levi, the distribution of its members throughout the whole of the Hebrew commonwealth was attended with many advantages. Every Levitical city became at once a school and a seat of justice. There the language, the traditions, the history, and the laws of their nation were the constant subjects of study, pursued with that zeal and earnestness which can only arise from the feeling of a sacred obligation, combined with the impulse of an ardent patriotism. Within their walls were deposited copies of their religious, moral, and civil institutions, which it was their duty not only to preserve, but to multiply. They kept, besides, the genealogies of the tribes, in which they marked the lineage of every family who could trace their descent to the Father of the Faithful. Being carefully instructed in the law, and possessed of the annals of their people from the earliest days, they were well qualified to supply the courts with magistrates and scribes, men who were fitted not only to administer justice, but also to frame a record of all their decisions. It is perfectly clear that, in the reign of David and of the succeeding kings, the judges and other legal officers were selected from among the Levites, there being in those days not fewer than six thousand of this learned body who held such appointments. RUSSELL.

## LESSON IV.

### JEWISH FESTIVALS.

Our limits will not permit us to indulge in a minute account of the Jewish Festivals. Still the three great institutions, at which all the males of the Hebrew nation were commanded to appear before Jehovah, are so frequently mentioned in the history of the Holy Land, that we must take leave to specify their several objects. The Feast of the Passover, comprehending that of unleavened bread, commemorated the signal deliverance of this wonderful people from the tyranny of Pharaoh. It was appointed to be kept on the fifteenth day of the first month, at least seven days, and to begin, as all their festivals began, in the evening, or at the going down of the sun.--The reader will attend to the distinction just stated, we mean the beginning and end of the sacred days. The celebration even of the ordinary Sabbath, as is well known, commenced on the evening of Friday, and terminated at the going down of the sun on Saturday. "From even unto even shall ye celebrate your Sabbaths."

The Feast of Pentecost was an annual offering of gratitude to Jehovah for having blessed the land with increase. It took place fifty days after the Passover, and hence the origin of its name in the Greek version of the Scriptures. Another appellation was applied to it—the Feast of Weeks—for the reason assigned by the inspired lawgiver: "Seven weeks shalt thou number unto thee; beginning to number the seven weeks from such time as thou puttest the sickle to the corn. And thou shalt keep the feast of weeks unto the Lord thy God with a tribute of a free-will offering of thine hand, in the place which Jehovah shall choose to place his name there. And thou shalt remember that thou wast a bondman in Egypt." This was a very suitable celebration in an agricultural society, where joy is always experienced upon gathering in the fruits of the earth. The Hebrews were especially desired on that happy occasion to contrast their improved condition, as freemen reaping their own lands, with the miserable state from which they had been rescued by the good providence of Jehovah. The month of May witnessed the harvest-home of all Palestine in the days of Moses, as well as in the present times; and no sooner was the pleasant toil of filling their barns completed, than all the males repaired to the holy city, with the appointed tribute in their hands, and the song of praise in their mouths.

The termination of the vintage was marked with a similar expression of thanksgiving, uttered by the assembled tribes in the place which had received the " name of Jehovah ;" that is, the visible manifestation of his presence and power. The precept for this observance—the Feast of Tabernacles--is given in the following terms :—" On the fifteenth day of the seventh month, when ye have gathered in the fruit of the land, ye shall keep a feast unto the Lord seven days. And ye shall take unto you, on the first day, the boughs of goodly trees, branches of palm trees, and the boughs of thick trees, and willows of the brook ; and ye shall rejoice before the Lord your God seven days. Ye shall dwell in booths seven days, that your generations may know that I made the children of Israel to dwell in booths when I brought them out of the land of Egypt." This festival was of the most lively and animated description, celebrated with a joyous heart, and under the canopy of heaven in a most delightful season of the year : and the rejoicing was chastened by the solemn religious recollections with which it was associated.

The Feast of Trumpets had a reference to the mode practised by many of the ancients for announcing the commencement of seasons and epochs. The beginning of every month was made known to the inhabitants of Jerusalem by the sound of musical instruments. "Blow up the trumpet in the new moon, in the time appointed, on our solemn feast-day; for this was a statue for Israel, a law of the God of Jacob." As the first day of the moon in September was the beginning of the civil year, the festival was greater and more solemn than on other occasions. The voice of the trumpets waxed louder than usual, and the public mind was instructed by a grave assurance from the mouth of the proper officer, that another year was added to the age of the world. "In the seventh month, in the first day of the month, shall ye have a Sabbath, a memorial of blowing of trumpets, an holy convocation. Ye shall do no servile work therein; but ye shall offer an offering made by fire unto the Lord."

Allusion was formerly made to the Jubilee, which occurred periodically after the lapse of forty-nine years. The benevolent uses of this most generous institution are universally known, especially as they respected personal freedom and the restoration of lands and houses. Great care was taken by the Jewish legislator to prevent an accumulation of property in one individual, or even in one tribe. Nor was his anxiety less to prevent the alienation of land, either by sale, mortgage, or marriage. With this view we find him enacting a rule, suggested by the case of the daughters of Zelophehad—who had been allowed to become heirs to their father—of which the object was to perpetuate the possession of landed estates within the limits of each particular tribe. "This is the thing which the Lord doth command concerning the daughters of Zelophehad: let them marry to whom they think best; only to the family of the tribe of their father shall they marry. And every daughter that possesseth an inheritance shall be wife unto one of the family of the tribe of her father, that the children of Israel may enjoy every man the inheritance of his fathers. Neither shall the inheritance remove from one tribe to another tribe; but every one of the tribes of the children of Israel shall keep himself to his own inheritance." RUSSELL.

## LESSON V.

### HISTORY OF THE ISRAELITES FROM THE ESTABLISHMENT OF THE MONARCHY TILL THE REVOLT OF THE TEN TRIBES.

It has been already remarked that the judges were not ordinary magistrates, elected by the people, or receiving their power by hereditary descent, but personages raised up by the special providence of God, to discharge the duties of an office which the peculiar circumstances of the chosen people from time to time rendered necessary. But after a period of about four centuries and a half, the Hebrews, either from the love of change, or because they imagined that their present form of government was not well adapted to the relations into which they had been brought with other states, chiefly by their disregard of the law of Moses, and by dissensions among themselves, demanded a king. With this demand Samuel, the last of the judges, complied, after he had warned them of the exactions and oppressions to which they might be exposed under a monarchy; and Saul, a young man of the tribe of Benjamin, remarkable for his stature, was elected. The qualities which recommended Saul to the choice of the tribes leave no room for doubt that it was chiefly as a military leader that he was raised to the throne. Nor was their expectation disappointed, so far as courage and zeal were required in conducting the affairs of war. But the impetuosity of the king's character, and a certain indifference in regard to the claims of the national faith, paved the way for his downfall and the extinction of his family. The scene of Gilboa, which terminated the career of the first Hebrew monach, exhibits a most affecting tragedy; in which the valour of a gallant chief, contrasted with his despair and sorrow, throws a deceitful lustre over an event which the reader feels that he ought to condemn.

David, to the skill of an experienced warrior, added a deep reverence for the institutions of his country and the forms of divine worship; whence he procured the high distinction of being a man after God's own heart. To this celebrated king was reserved the honour of taking from the Jebusites a strong fortress on the borders of Judah and Benjamin, and of laying the foundations of Jerusalem, viewed, at last, as the metropolis of Palestine, and the seat of the Hebrew government. On Mount Zion he built a suburb of considerable beauty and strength, which continued for many years to bear his name, and to reflect the magnificence of his genius. Not satisfied with this acquisition, he extended his arms on all sides, till the borders of his kingdom reached from the river Euphrates to the confines of Egypt. But the splendour of his reign was afterwards clouded by domestic guilt and treason and the nation, which could now have defied the power of its bitterest enemies, was divided and miserably reduced by the foul passions that issued from the royal palace. Still, notwithstanding the rebellion of Absalom, and the defection of certain military leaders, David bequeathed to his successor a flourishing kingdom; rapidly advancing in the arts of civilized life, enjoying an advantageous commerce, the respect of the neighbouring states, and a decided preponderance among the minor governments of Western Asia. His last years were spent in making preparations for the building of a temple at Jerusalem; a work which he himself was not allowed to accomplish, because his hands were stained with blood, which, however justly shed, rendered them unfit for erecting an edifice to the God of mercy and peace.

The success which had attended the arms of his father, rendered the accession of Solomon tranquil and secure, so far, at least, as we consider the designs of the surrounding nations. Accordingly, finding himself in possession of quiet, as well as of an overflowing treasury, he proceeded to realize the pious intentions of David in regard to the house of God, and thereby to obey the last commands which had been imposed upon him before he received the crown. The chief glory of Solomon's reign is identified with the erection of the temple. Nor were the advantages arising from this great undertaking confined to the spiritual objects to which it was principally subservient. On the contrary, the necessity of employing foreign artists, and of drawing part of his materials from a distance, suggested to the king the benefits of a regular trade; and as the plains of Syria produced more corn than the natives could consume, he supplied the merchants of Tyre and the adjoining ports with a valuable commodity, in return for the manufactured goods which his own subjects could not fabricate. It was in his reign that the Hebrews first became a commercial people; and although considerable obscurity still hangs over the tracks of navigation which were pursued by the mariners of Solomon, there is no reason to doubt that his ships were to be seen on the Mediterranean, the Red Sea, and the Persian Gulf. It was also in this reign that the limits of Jewish power attained their utmost reach, comprehending even the remarkable district of Palmyrene, a spacious and fertile province in the midst of a frightful desert. There were in it two principal towns, Thapsacus or Tiphsah and Palmyra, from, the latter of which the whole country took its name. Solomon, it is well known, took pleasure in adding to its beauty and strength, as being one of his main defences on the eastern border, and hence it is spoken of in Scripture as Tadmor in the wilderness.

But the popularity of Solomon's government did not keep pace with the rapidity of his improvements or the magnificence of his works. Perhaps the vast extent of his undertakings may have led to unusual demands upon the industry of the people, and may have given rise to those discontents which, though repulsed during his own life-time, were openly and boldy avowed on the accession of his son Rehoboam. This prince rejecting the advice of his aged counsellors, and following that of the younger and more violent, soon had the misfortune to see the greater part of his kingdom wrested from him. In reply to the address of his people, who entreated an alleviation of their burdens, he declared that, instead of requiring less at their hands, he should demand more. "My father made your yoke heavy, I will add to your yoke; my father chastised you with whips, but I will chastise you with scorpions." Such a resolution, expressed in language at once so contemptuous and severe, alienated from his government ten tribes, who sought a more indulgent master in Jeroboam, a declared enemy of the house of David. Hence the origin of the kingdom of Israel, as distinguished from that of Judah; and hence, too, the disgraceful contentions between those kindred states, which acknowledged one religion, and professed to be guided by the same law.

## LESSON VI.

### FROM THE REVOLT OF THE TEN TRIBES TILL THE CAPTIVITY.

Afrer the revolt of the ten tribes, Jerusalem soon ceased to be regarded by the Israelites as the centre of their religion, and the bond of union among the descendants of Abraham. Jeroboam erected in his kingdom the emblems of a less pure faith, to which he confined the attention of his subjects; while the frequent wars that ensued, and the treaties formed on both sides with the Gentile nations on their respective borders, completed the estrangement which ambition had begun. Little attached to the native line of princes, the Israelites placed on the throne of Samaria a number of adventurers, who had no qualities to recommend them besides military courage and an irreconcileable hatred towards the more legitimate claimants of the house of David. The reigns of these sovereigns possess little interest; let it suffice, therefore, to say, that, about two hundred and seventy years after the death of Solomon, the Israelities were subdued by Shalmaneser, the powerful monarch of Assyria, who carried them away captive into the remote provinces of his vast empire.

The kingdom of Judah, less distracted by the pretensions of usurpers, and confirmed in the principles of patriotism by a more rigid adherence to the law of Moses, continued during one hundred and thirty years longer to resist the encroachments of the rival powers, Egypt and Assyria, which now began to contend in earnest for the possession of Palestine. Several endeavours were made, even after the destruction of Samaria, to unite the energies of the twelve tribes, and thereby secure the independence of the sacred territory. But a pitiful jealousy had succeeded to the aversion created by a long course of hostile aggression, while the overwhelming armies, which incessantly issued from the Euphrates and the Nile to select a field of battle within the borders of Canaan, soon left to the feeble councils of Jerusalem no other choice than that of an Egyptian or an Assyrian master. At length, in the year six hundred and two before the Christian era, when Jehoiakim was on the throne of Judah, Nebuchadnezzar, who already shared with his father the government of Assyria, advanced into Palestine at the head of a formidable army. A timely submission saved the city, as well as the life of the pusillanimous monarch. But, after a short period, finding the conqueror engaged in more important affairs, the vanquished king made an effort to recover his dominions by throwing off the Babylonian yoke. The siege of Jerusalem was renewed with greater vigour on the part of the invaders, in the course of which Jehoiakim was killed, and his son Coniah or Jehoiachim ascended the throne. Scarcely, however, had the new sovereign taken up the reins of government, than he found it necessary to open the gates of his capital to the Assyrian prince, who carried him, his principal nobility, and the most expert of his artizans, as prisoners to the banks of the Tigris. The nominal authority was now confined to a brother or uncle of the captive king, whose original name, Mattaniah, was changed to Zedekiah by his lord paramount, who considered him merely as the governor of a province. Impatient of an office so subordinate, and instigated, it is probable, by emissaries from Egypt, he resolved to hazard his life and liberty for the chance of reconquering the independence of his crown. This imprudent step brought Nebuchadnezzar once more before the walls of Jerusalem. A siege which appears to have continued fifteen or sixteen months, terminated in the final reduction of the holy city, and in the captivity of Zedekiah, who was treated with the utmost severity. His two sons were executed in his presence, after which his eyes were put out; when, being loaded with fetters, he was carried to Babylon and thrown into prison. The work of destruction was intrusted to Nebuzar-adan, the captain of the guard, who "burnt the house of the Lord, and the king's house, and all the houses of Jerusalem, and every great man's house burnt he with fire. And the army of the Chaldees that were with the captain of the guard brake down the walls of Jerusalem round about. The rest of the people that were left in the city, and the fugitives that fell away to the king of Babylon, with the remnant of the multitude, did the captain of the guard carry away. But he left the poor of the land to be vine-dressers and husbandmen."

## LESSON VII.

### FROM THE RESTORATION OF THE JEWS TILL THE BIRTH OF CHRIST.

It had been foretold by the prophets that the Jews should remain in captivity during seventy years; and as they were led away exactly six centuries before the Christian era, their return to the Holy Land must have occurred about the year 530 prior to the same great epoch. The names of Zerubbabel, Nehemiah, and Ezra, occupy the most distinguished place among those worthies who were selected by divine Providence to conduct the restoration of the chosen people. After much toil, interruption, and alarm, Jerusalem could once more boast of a temple, which, although destitute of the rich ornaments lavished upon that of Solomon, was at least of equal dimensions, and erected on the same sacred ground. But the worshipper had to deplore the absence of the ark, the symbolical Urim and Thummim, the Shechinah or Divine Presence, and the celestial fire which had maintained an unceasing flame upon the altar. Their sacred writings, too, had been dispersed, and their ancient language was fast becoming obsolete. To prevent the extension of so great an evil, the more valuable manuscripts were collected and arranged, containing the law, the earlier prophets, and the inspired hymns used for the purpose of devotion.

Under the Persian satraps, who directed the civil and military government of Syria, the Jews were permitted to acknowledge the authority of their High Priest, to whom, in all things pertaining to the law of Moses, they rendered the obedience which was due to the head of their nation. Their prosperity, it is true, was occasionally diminished or increased by the personal character of the sovereigns who successively occupied the throne of Cyrus; but no material change in their circumstances took place until the victories of Alexander the Great had laid the foundation of the Syro-Macedonian kingdom in Western Asia, and given a new dynasty to the crown of Egypt. The struggles which ensued between these powerful states frequently involved the interests of the Jews, and made new demands on their allegiance; although it is admitted, that as each was desirous to conciliate a people who claimed Palestine for their unalienable heritage, the Hebrews at large were, during two centuries, treated with much liberality and favour. But this generosity or forbearance was interrupted in the reign of Antiochus Epiphanes, who, alarmed by the report of insurrections, and harassed by the events of an unsuccessful war in Egypt, directed his angry passions against the Jews. Marching suddenly upon Jerusalem, he put forty thousand of the inhabitants to death, pillaged the treasury, seized all the sacred vessels, and commanding a sow to be sacrificed on the altar of burnt-offerings, caused every part of the temple, even the Holy of Holies, to be sprinkled with the blood of the unclean animal. A short time afterwards, he issued an edict for the extermination of the whole Hebrew race, which one of his generals, Apollonius, proceeded to execute with the most atrocious cruelty. Driven to desperation by these severities, the Jews flew to arms, led on by the brave family of the Maccabees, whose valour and perseverance soon enabled them to dispute with the powerful monarch of Syria the sovereignty of Palestine. Success at last crowned the efforts of those who fought for their religion and liberty, and the Maccabees or Asmoneans raised themselves to supreme power by uniting the offices of king and pontiff They continued to govern Palestine for upwards of a hundred years; during the greater part of which time the Jews were far from enjoying uninterrupted tranquillity. The kingdom was often threatened by external enemies, and torn by internal dissensions, till at length the disputes of two rival claimants of the throne gave a pretext for the interference of the Romans. Pompey, who had already overrun the finest provinces of Syria, advanced to Jerusalem, and having listened to the claims of the two competitors, settled the priesthood upon Hyrcanus, but without annexing to it the civil power. After some delay this was conferred by Cæsar on Antipater, an Idumean, who was succeeded by his son Herod.

The reign of Herod, who, to distinguish him from others of the same name, is usually called the Great, was no less remarkable for domestic calamity than for the public peace and happiness. Urged by suspicion, he put to death his beloved wife Mariamne, her mother, brother, grandfather, uncle, and two sons. His palace was the scene of incessant intrigue, misery, and bloodshed; his nearest relations being ever the chief instruments of his worst sufferings and fears. It was, perhaps, to divert his apprehensions and remorse that he employed so much of his time in the labours of architecture. Besides a royal residence on Mount Zion, he built a number of citadels throughout the country, and laid the foundations of several splendid towns. He also formed the design of rebuilding the temple in its former splendour and greatness, which had been much impaired by the lapse of five hundred years, and the ravages of successive wars. As it was necessary to remove the dilapidated parts of the edifice before the new building could be begun, the Jews looked on with a suspicious eye; apprehensive lest the king, who had already introduced many innovations at variance with the national habits and prejudices, should obliterate every vestige of their ancient sanctuary, under pretence of doing honour to their faith. But the prudence of Herod calmed their fears; and, as the work proceeded, they saw with the utmost joy, a fabric of stately architecture crowning the brow of Mount Moriah, with glittering masses of white marble and pinnacles of gold.

As Herod advanced towards old age his troubles multiplied, and his apprehensions were increased, till at length, about four years prior to the common era of Christianity,* he sank under the pressure of a loathsome disease. He was permitted by the Romans so far to exercise the privileges of an independent prince as to distribute by will the inheritance of sovereignty among the more favoured of his children; and, in virtue of this indulgence, he assigned to Archelaus, the government of Idumea, Samaria, and Judæa, while he bestowed on Herod-Antipas a similar authority over Peræa and Galilee: Ituræa and Trachonitis were afterwards given by the Romans to Philip, the eldest son of Herod. Archelaus, the metropolis of whose dominions was Jerusalem, ruled in quality of tetrarch about nine years; but so little to the satisfaction either of his master at Rome, or of the people whom he was appointed to govern, that at the end of this period he was summoned to render an account of his administration at the imperial tribunal, when he was deprived of his power and wealth, and finally banished into Gaul Judæa was now reduced to a Roman province, dependent on the prefecture of Syria, though usually placed under the inspection of a subordinate officer, called the procurator or governor. Thus the sceptre passed away from Judah, and the lawgiver, descended from the family of Jacob, ceased to enjoy power within the confines of the promised land.

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* Our Lord's birth took place four years before the commencement of the vulgar era, so that the year 1833 ought to be 1837.

It was at this epoch, in the last year of the reign of Herod, that the Messias was born, and conveyed into Egypt for security. The unjust and cruel government of Archelaus, for which, as has just been related, he was stripped of his authority by the head of the empire, was probably the cause why the holy family did not again take up their residence in Judea, but preferred the milder rule of Herod-Antipas. When Joseph "heard that Archelaus did reign in Judea in the room of Herod his father, he was afraid to go thither: notwithstanding, being warned of God in a dream, he turned aside into the parts of Galilee: and he came and dwelt in a city called Nazareth."

## LESSON VIII.

### FROM THE BIRTH OF CHRIST TILL THE DESTRUCTION OF JERUSALEM.

Upon the exile of Archelaus, the prefecture of Syria was committed to Publius Sulpicius Quirinius. This commander is mentioned in the gospel of St. Luke by the name of Cyrenius, and is described as the person under whom the tax was imposed, which had previously rendered it necessary for Joseph and Mary to go from Nazareth to Bethlehem to be enrolled. It was about the twenty sixth year of our epoch that Pontius Pilate was nominated to the government of Judæa. Ignorant or indifferent as to the prejudices of the Jews, he roused amongst them a spirit of the most active resentment, by displaying the image of the emperor in Jerusalem, and by seizing part of their sacred treasure for the purposes of general improvement. As the fiery temper of the inhabitants drove them, on most occasions, to acts of violence, he did not hesitate to employ force in return; and we find, accordingly, that his administration was dishonoured by several acts of military execution directed against the Jews and Samaritans indiscriminately. The character of Pilate, and of the times in which he lived, given in profane history is in strict harmony with the narrative of the gospel. The expectation of the Jews when Jesus of Nazareth first appeared, their subsequent disappointment and rage—their hatred and impatience of the Roman government,—the perplexity of the military chief and the motive which at length induced him to sacrifice the innocent person who was cited before him.—are facts which display the most perfect accordance with the tone of civil history at that remarkable period.

During the troubles which agitated Judæa, the districts that owned the sovereignty of Herod-Antipas and Philip, namely, Galilee and the country beyond the Jordan, enjoyed comparative quiet. The former, who is the Herod described by our Saviour as "that fox," was a person of cool and crafty disposition, and might have terminated his long reign in peace, had not Herodias, whom he seduced from his brother Philip, irritated his ambition by pointing to the superior rank of his nephew, Herod-Agrippa, whom Caligula had been pleased to raise to a provincial throne. Urged by his wife to solicit a similar elevation, he presented himself at Rome, and obtained an audience of the emperor; but the successor of Tiberius was so little pleased with his conduct on this occasion, that he divested him of the tetrarchy, and banished him into Gaul.

The death of Philip, and the degradation of the Galilean tetrarch, paved the way for the advancement of Herod-Agrippa to all the honour and power which had belonged to the family of David. He was permitted to reign over the whole of Palestine, having under his dominion the usual number of Roman troops, which experience had proved to be necessary for the peace of a province at once so remote and so turbulent. But no position could be more difficult to hold with safety and reputation than that which was occupied by this Hebrew prince. He was assailed on the one hand by the jealousy of the Roman deputies, and on the other by the suspicions of his own countrymen, who could never divest themselves of the fear that his foreign education had rendered him indifferent to the rites of the Mosaical law. To satisfy the latter, he spared no expense in conferring magnificence on the daily service of the temple, while he put forth his hand to presecute the Christian church, in the persons of Peter and James the brother of John. To remove every ground of disloyalty from the eyes of the political agents who were appointed by Claudius to watch his conduct, he ordered a splendid festival at Cesarea in honour of the new emperor; on which occasion, when arrayed in the most gorgeous attire, certain words of adulation reached his ear, not fit to be addressed to a Jewish monarch. The result will be best described in the words of sacred Scripture: "And upon a set day Herod, arrayed in royal apparel, sat upon his throne, and made an oration to them. And the people gave a shout, saying, It is the voice of a god, and not of a man. And immediately the angel of the Lord smote him, because he gave not God the glory; and he was eaten of worms, and gave up the ghost." He left a son and three daughters, of whom Herod-Agrippa II., Bernice, and Drusilla, make a conspicuous figure towards the close of the Acts. These events took place between the fortieth and fiftieth years of the Christian era.

The youth and inexperience of Herod-Agrippa II. dictated to the Roman government the propriety of assuming once more the entire direction of Jewish affairs, especially as the people were every day becoming more turbulent and impatient of foreign dominion; and accordingly, Caspius Fadus, Felix, and Festus were successively appointed procurators of Judæa. Fadus was a stern but upright soldier; but the administration of Felix was an habitual combination of violence and fraud: an equal stranger to righteousness and temperance, this ruler presented a fit subject for the eloquence of St. Paul. The short residence of Festus procured for the unhappy Jews a respite from apprehension. He laboured successfully to put down the bands of insurgents, whose ravages were now inflicted indiscriminately upon foreigners and their own countrymen; nor was he less active in checking the excesses of the military, so long accustomed to rapine and free quarter. Herod-Agrippa at the same time transferred the seat of his government to Jerusalem, where his presence served to moderate the rage of parties, and thereby to postpone the final rupture between the provincials and their imperial master.

But this brief interval of repose was followed by an increased degree of irritation and fury. Florus, who had succeeded Festus in the procuratorship, countenanced by Cestius Gallus the prefect of Syria, so galled the people by his tyranny and by certain insults directed against their faith, that the Jewish inhabitants of Cesarea set his power at defiance, and declared their resolution to repel his injuries by force. The capital was soon actuated by a similar spirit, and made preparations for defence. Cestius marched to the gates, and demanded entrance for the imperial cohorts whose aid was required to support the garrison within. The citizens, having refused to comply, already anticipated the horrors of a siege; when, after a few days, they saw to their great surprise, the Syrian prefect in full retreat, carrying with him his formidable army. Sallying from the different outlets with arms in their hands, they pursued the fugitives with the usual fury of an incensed multitude; and, overtaking their enemy at the narrow pass of Bethoron, they avenged the cause of independence by a considerable slaughter of the legionary soldiers, and by driving the remainder to an ignominious flight. Nero received the intelligence of this defeat while amusing himself in Greece, and immediately sent Vespasian into Syria to assume the government, with instructions to restore the tranquility of the province by moderate concessions, or by the most rigorous warfare. It was in the sixty-seventh year of Christianity that this great commander entered Judea, accompanied by his son, the celebrated Titus. The result is too well known to require details. A series of sanguinary battles deprived the Jews of their principal towns one after another, until they were at length shut up in Jerusalem; the siege and final reduction of which compose one of the most affecting stories that are anywhere recorded in the annals of the human race.

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## LESSON IX.

### ANCIENT AND PRESENT STATE OF THE HOLY LAND.

Palestine, whether viewed as the source of our religious faith, or as the most ancient fountain of our historical knowledge, has at all times been regarded with feelings of the deepest interest and curiosity. Inhabited for many ages by a people entitled above all others to the distinction of peculiar, it presents a record of events such as have not come to pass in any other land; monuments of belief denied to all other nations; hopes not elsewhere cherished but which, nevertheless, are connected with the destiny of the whole human race, and stretch forward to the consummation of all terrestrial things. Its scenes, which no art can change, and hardly any description can disguise, are standing and undeniable proofs of the truth and inspiration of that sacred volume, in which God has been pleased to reveal his will to his fallen creatures. The hills stand round about Jerusalem as they stood in the days of David and of Solomon. The dew falls on Hermon; the cedars grow on Libanus; and Kishon, that ancient river, draws its stream from Tabor as in the times of old. The sea of Galilee still presents the same natural accomplishments; the fig-tree springs up by the way-side, the sycamore spreads its branches, and the vines and the olives still climb the sides of the mountains. The desolation which covered the cities of the plain is not less striking at the present hour than when Moses with an inspired pen recorded the judgment of God; the swellings of Jordan are not less regular in their rise than when the Hebrews first approached its banks; and he who goes down from Jerusalem to Jericho still incurs the greatest hazard of falling among thieves. There is, in fact, in the scenery and manners of Palestine, a perpetuity that accords well with the everlasting import of its historical records, and which enables us to identify with the utmost readiness the local imagery of every great transaction.

The extent of this remarkable country has varied at different times, according to the nature of the government which it has either enjoyed or been compelled to acknowledge. When it was first occupied by the Israelites, the land of Canaan, properly so called, was confined between the shores of the Mediterranean and the western bank of the Jordan; the breadth at no part exceeding fifty miles while the length hardly amounted to three times that space. At a later period the arms of David and of his immediate successor carried the boundaries of the kingdom to the Euphrates and Orontes on the one hand, and in an opposite direction to the remotest confines of Edom and Moab. The population, as might be expected, has undergone a similar variation. Proceeding on the usual grounds of calculation, we may infer, from the number of warriors whom Moses conducted through the desert, that the Hebrew people, when they crossed the Jordan, did not fall short of two millions; while, from facts recorded in the book of Samuel, we may conclude with greater confidence that the enrolment made, under the direction of Joab, must have returned a gross population of at least five millions and a half.

The present aspect of Palestine, under an administration where every thing decays and nothing is renewed, can afford no just criterion of the accuracy of such statements. Hasty observers have, indeed, pronounced, that a hilly country destitute of great rivers could not, even under the most skilful management, supply food for so many mouths. But this precipitate conclusion has been vigourously combated by the most competent judges, who have taken pains to estimate the produce of the soil under the fertilizing influence of a sun which may be regarded as almost tropical, and of a well-regulated irrigation, which the Syrians knew how to practise with the greatest success. Canaan, it must be admitted could not be compared to Egypt in respect to corn. There is no Nile to scatter the riches of an inexhaustible fecundity over its valleys and plains. Still it is not without reason that Moses described it as " a good land, a land of brooks of water, of fountains, and depths that spring out of valleys and hills; a land of wheat, and barley, and vines, and fig-trees, and pomegranates; a land of oil-olive and honey; a land wherein thou shalt eat bread without scarceness, thou shalt not lack any thing in it; a land whose stones are iron, and out of whose hills thou mayest dig brass."

The reports of the latest travellers comfirm the accuracy of the picture drawn by the divine legislator. Near Jericho the wild olives continue to bear berries of a large size, which give the finest oil. In places subjected to irrigation the same field, after a crop of wheat in May, produces pulse in autumn. ' Several of the trees are continually bearing flowers and fruit at the same time, in all their stages. The mulberry, planted in straight rows in the open fields, is festooned by the tendrils of the vine. If this vegetation seems to languish or become extinct during the extreme heats; if, in the mountains, it is at all seasons detached and interrupted,—such exceptions to the general luxuriance are not to be ascribed simply to the general character of all hot climates, but also to the state of barbarism in which the great mass of the present population is immersed.

Even in our day, some remains are to be found of the walls which the ancient cultivators built to support the soil on the declivities of the mountains; the forms of the cisterns in which they collected the rain-water; and traces of the canals by which this water was distributed over the fields. These labours necessarily created a prodigious fertility under an ardent sun, where a little moisture was the only thing requisite to revive the vegetable world.

The accounts given by native writers respecting the productive qualities of Judæa are not in any degree opposed even by the present aspect of the country. The case is exactly the same with some islands in the Archipelago; a tract, from which, in those days, a hundred individuals can hardly draw a scanty subsistence, formerly maintained thousands in affluence. Moses might justly say that Canaan abounded in milk and honey. The flocks of the Arabs still find in it luxuriant pasture, while bees deposit in the holes of the rocks their delicious stores which are sometimes seen flowing down the surface.

But it has never been denied that there is a remarkable difference between the two sides of the ridge which forms the central chain of Judæa. On the western acclivity the soil rises from the sea towards the elevated ground in four distinct terraces, which are covered with an unfading verdure. On the eastern side, however, the scanty coating of mould yields a less magnificent crop. From the summit of the hills a desert stretches along to the Lake Asphaltites, presenting nothing but stones and ashes, and a few thorny shrubs. The sides of the mountain enlarge and assume an aspect at once more grand and more barren. By little and little the scanty vegetation languishes and dies; even mosses disappear, and a red burning hue succeeds to the whiteness of the rocks. In the centre of this amphitheatre there is an arid basin inclosed on all sides with summits scattered over with a yellow-coloured pebble, and affording a single aperture to the east, through which the surface of the Dead Sea and the distant hills of Arabia present themselves to the eye. In the midst of this country of stones, encircled by a wall, we perceive, on the one side, extensive ruins, stunted cypresses, and bushes of the aloe and prickly pear ; while, on the other, there are huddled together a number of heavy square masses; very low, without chimneys or windows, and more like prisons or sepulchres than houses, which, with their flat roofs, would appear one uninterrupted level to the eye, were the uniformity of the plan not broken by the steeples of the churches and the minarets of the mosques. This spot is Jerusalem.

*Abridged from Palestine—Cabinet Library.*

## LESSON X.

### THE BIRTH OF THE SAVIOUR ANNOUNCED

When the Saviour of Mankind was born in Judæa, his birth was attended with no external splendour which could mark him out as the promised Messiah. The business of life was proceeding in its usual train. The princes of the world were pursuing their plans of ambition and vanity. The chief priests and scribes, the interpreters of revelation, were amusing the multitude with idle traditions. Jesus lay neglected in the stable of Bethlehem ;

and the first rays of the Sun of Righteousness beamed unnoticed on the earth. But the host of heaven were deeply interested in this great event. They contemplated, with pleasure, the blessings which were about to be dispensed to men; and from their high abode a messenger descended to announce the dawn of that glorious day, which the prophets had seen from afar, and were glad. The persons to whom these tidings of joy were first proclaimed were not such, indeed, as the world would have reckoned worthy of so high a pre-eminence. They were not the wise, or the rich, or the powerful of the earth. That which is highly esteemed among men is often of little value in the sight of God. The rich and the poor are alike to him. He prefers the simplicity of a candid mind to all those artificial accomplishments which attract the admiration of a giddy multitude. It was to the shepherds of Bethlehem that the angel appeared,—to men obscure and undistinguished among their brethren, who, in the silence of night, were following the duties of their peaceful occupation, far from the vices of courts and the prejudices of the synagogue. But the manner in which the birth of the Messiah was announced, was suited to the dignity of so great an occasion. At midnight, these shepherds were tending their flocks, and all was dark and still in the fields of Bethlehem: when, on a sudden, a light from heaven filled the plain, and the angel of the Lord stood revealed before them. So unusual an appearance struck them with awe: they knew not with what tidings this messenger might be charged. But the voice of the angel soon quieted their fears; it was a message of mercy with which he was intrusted. "Behold, I bring unto you good tidings of great joy, which shall be to all people. For unto you is born this day, in the city of David, a Saviour, who is Christ the Lord."

MOODIE.

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## LESSON XI.

### THE TEACHING AND CHARACTER OF JESUS CHRIST.

Jesus Christ appears among men full of grace and truth; the authority and the mildness of his precepts are irresistible. He comes to heal the most unhappy of mortals, and all his wonders are for the wretched. In order to inculcate his doctrines he chooses the apologue, or parable, which is easily impressed on the minds of the people. While walking in the fields, he gives his divine lessons. When surveying the flowers that adorn the mead he exhorts his disciples to put their trust in Providence, who supports the feeble plants, and feeds the birds of the air; when he beholds the fruits of the earth, he teaches them to judge of men by their works; an infant is brought to him, and he recommends innocence; being among shepherds he gives himself the appellation of the *Good Shepherd*, and represents himself as bringing back the lost sheep to the fold. In spring he takes his seat upon a mountain, and draws from the surrounding objects instruction for the multitude sitting at his feet. From the very sight of this multitude, composed of the poor and the unfortunate, he deduces his beatitudes: *Blessed are they that weep—blessed are they that hunger and thirst.* Such as observe his precepts, and those who slight them, are compared to two men who build houses, the one upon a rock, the other upon sand. When he asks the woman of Samaria for drink, he expounds to her his heavenly doctrine, under the beautiful image of a well of living water.

His character was amiable, open and tender, and his charity unbounded. The evangelist gives us a complete and admirable idea of it in these few words: *He went about doing good.* His resignation to the will of God is conspicious in every moment of his life; he loved and felt the sentiment of friendship: the man whom he raised from the tomb, Lazarus, was his friend; it was for the sake of the noblest sentiment of life that he performed the greatest of his miracles. In him the love of country may find a model. "O Jerusalem, Jerusalem," he exclaimed, at the idea of the judgments which threatened that guilty city, "how often would I have gathered thy children together, even as a hen gathereth her chickens under her wings, and ye would not!" Casting his sorrowful eyes from the top of a hill over this city, doomed for her crimes to a signal destruction, he was unable to restrain his tears: "*He beheld the city,*" says the evangelist, "*and wept over it.*" His tolerance was not less remarkable: when his disciples begged him to command fire to come down from heaven on a village of Samaria, which had denied him hospitality, he replied with indignation, "*Ye know not what manner of spirit ye are of.*"

CHATEAUBRIAND.

## LESSON XII.

### ON THE DEATH AND SACRIFICE OF CHRIST.

Father! *the hour is come.* What hour? An hour the most critical, the most pregnant with great events, since hours had begun to be numbered, since time had begun to run. It was the hour in which the Son of God was to terminate the labours of his important life, by a death still more important and illustrious; the hour of atoning, by his sufferings, for the guilt of mankind: the hour of accomplishing prophecies, types, and symbols, which had been carried on through a series of ages: the hour of concluding the old, and of introducing to the world the new dispensation of religion; the hour of his triumphing over the world, and death, and hell: the hour of his erecting that spiritual kingdom which is to last for ever. This was the hour in which Christ atoned for the sins of mankind, and accomplished our eternal redemption. It was the hour when the great sacrifice was offered up, the efficacy of which reaches back to the first transgression of man, and extends forward to the end of time: the hour when, from the cross, as from an high altar, that blood was flowing which washed away the guilt of the nations. This awful dispensation of the Almighty contains mysteries which are beyond the discovery of man. It is one of those things into which *the angels desire to look.* What has been revealed to us is, That the death of Christ was the interposition of heaven for preventing the ruin of mankind. We know that, under the government of God, misery is the natural consequence of guilt. After rational creatures had, by their criminal conduct, introduced disorder into the Divine kingdom, there was no ground to believe that, by prayers and patience alone, they could prevent the destruction which threatened them. The prevalence of propitiatory sacrifices throughout the earth proclaims it to be the general sense of mankind, that mere repentance is not of sufficient avail to expiate sin, or to stop its penal effects. By the constant allusions which are carried on in the New Testament to the sacrifices under the law as pre-signifying a great atonement made by Christ, and by the strong expressions which are used in describing the effects of his death, the sacred writers show as plainly as language allows, that there was an efficacy in his sufferings far beyond that of mere example and instruction. Part we are capable of beholding; and the wisdom of what we behold we have reason to adore. We discern, in this plan of redemption, the evil of sin strongly exhibited, and the justice of the Divine government awfully exemplified, in Christ suffering for sinners. But let us not imagine that our present discoveries unfold the whole influence of the death of Christ. It is connected with causes into which we cannot penetrate. It produces consequencces too extensive for us to explore. *God's thoughts are not as our thoughts.* In all things we see only *in part*; and here, if any where, we see only *through a glass darkly.* This, however, is fully manifest, that redemption is one of the most glorious works of the Almighty. If the hour of the creation of the world was great and illustrious, that hour, when, from the dark and formless mass, this fair system of nature arose at the Divine command, when the *morning stars sang together, and all* *the sons of God shouted for joy;* no less illustrious is the hour of the restoration of the world, the hour when, from condemnation and misery, it emerged into happiness and peace. With less external majesty it has attended, but is on that account the more wonderful, that, under an appearance so simple, such great events were covered.

Blair.

## LESSON XIII.

### THE CHRISTIAN SALVATION.

Salvation means deliverance from something that is feared or suffered, and it is therefore a term of very general application; but in reference to our spiritual condition, it means deliverance from those evils with which we are afflicted in consequence of our departure from God.

It implies deliverance from *ignorance*—not ignorance of human science, but from ignorance of God, the first and the last and the greatest and the wisest, the holiest and the best of beings, the maker of all things, the centre of all perfection, the fountain of all happiness. Ignorant of God, we cannot give Him acceptable worship; we cannot rightly obey His will, we cannot hold communion with Him here, we cannot be prepared for the enjoyment of His presence hereafter. But from this ignorance we are rescued by the salvation of the gospel, which reveals God to us, which makes us acquainted with His nature, His attributes, His character, His government, and which especially unfolds to us that scheme of mercy in which He has most clearly manifested his own glory.

Salvation implies deliverance from *guilt.* The law denounces a penalty against those who break it. That penalty is exclusion from heaven, and deprivation of God's favour and consignment to the place of misery. But from this penalty there is deliverance provided. Christ has expiated guilt. He has "made reconciliation for iniquity," He has purchased eternal life. And "to those who are in him there is now no condemnation." Their sins are forgiven. They are at "peace with God." And there is nothing to prevent him from pouring out upon them the riches of his mercy, and making them happy for ever.

This salvation implies deliverance from the *power of sin.* We are naturally the slaves of this power. Sin reigns in us as the descendants of apostate Adam. We cannot throw off its yoke by any virtue or efforts of our own. And so long as it maintains its ascendancy, we are degraded, and polluted, and miserable. But provision is made in the Gospel for our emancipation. Christ "gave himself for us that he might redeem us from all our iniquities," and that sin might have no "more dominion over us," and all who believe in him are made free to serve that God whose service is the sweetest liberty and the highest honor.

The salvation of the gospel implies deliverance from the *ills and calamities of life.* It does not imply this literally; for, under the dispensation of the gospel, there is strictly speaking no exemption from bodily disease, from outward misfortune, or from the thousand distresses that flesh is heir to. But Christ has given such views of the providence of God,—he has brought life and immortality so clearly to light, and has so modified and subdued the operations of sin, which is the cause of all our sufferings, that these are no longer real evils to them that believe. When we are brought into a filial relation to God, the afflictions that he sends from a part of that discipline which he employs to improve our graces, and to prepare us for his presence. He supports us under them, he overrules and sanctifies them for our spiritual advantage, and he thus divests them of all that is frightful, and converts them into blessings.

This salvation implies deliverance from *the power and the fear of death.* It is, indeed, an awful thing to die. Nature recoils from the agonies of dissolution, and from the corruption of the grave. But Christ has " vanquished death, and him that had the power of it." He has plucked out its sting, he has secured our final triumph over it, and has thus taught us to dismiss all our alarms. Our bodies must return to our kindred earth ; but they shall be raised again, spiritual, incorruptable, and glorious. They shall be reunited to their never-dying and sainted partners and shall enter into the regions of immortality.

And while the salvation of the gospel implies our deliverance from all these evils, it also implies our admission into the heavenly state. It is in order to bring us there at last that all the benefits just enumerated are conferred upon us, and it is there accordingly that they shall be consummated. We are delivered from ignorance ; and in heaven no cloud shall obscure our view—no veil of prejudice shall cover our hearts. We are delivered from guilt ; and in heaven, at its very threshold, our acquittal and justification shall be proclaimed before an assembled world, and God's reconciled countenance shall shine upon us for ever. We are delivered from the power of sin, and in heaven there shall be found no tempter and no temptation,—nothing that defileth and nothing that is defiled. We are delivered from the ills and calamities of life; and in heaven all tears shall be wiped from the eye, and all sorrow banished from the heart,—there shall be undecaying health, and there shall be unbroken rest, and there shall be songs of unmingled gladness. We are delivered from the power and fear of death; and in heaven there shall be no more death; the saints shall dwell in that sinless and unsuffering land as the redeemed of him who "was dead and is alive again, and liveth for evermore." All things are theirs; theirs is the unfading crown, theirs is the incorruptable inheritance, theirs is the kingdom that cannot be moved, theirs are the blessedness and the glories of eternity.

THOMSON.

## LESSON XIV.

### JERUSALEM BEFORE THE SIEGE.

*Titus.* It must be—
And yet it moves me, Romans! it confounds
The counsel of my firm philosophy,
That Ruin's merciless ploughshare must pass o'er,
And barren salt be sown on yon proud city.
As on our olive-crowned hill we stand,
Where Kedron at our feet its scanty waters
Distils from stone to stone with gentle motion,
As through a valley sacred to sweet peace,

How boldly doth it front us! how majestically!
Like a luxurious vineyard, the hill-side
Is hung with marble fabrics, line o'er line,
Terrace o'er terrace, nearer still, and nearer
To the heavens. There bright and sumptuous palaces,
With cool and verdant gardens interspersed.
There towers of war that frown in massy strength,
While over all hangs the rich purple eve,
As conscious of its being her last farewell
Of light and glory to that faded city,
And as our clouds of battle, dust, and smoke
Are melted in the air, beholds the Temple
In undisturb'd and lone serenity,
Finding itself a solemn sanctuary.
In the profound of heaven! It stands before us
A mount of snow, fretted with golden pinnacles.
The very sun, as though he worship'd there,
Lingers upon the gilded cedar roofs
And down the long and branching porticos,
On every flowery-sculptured capital,
Glitters the homage of his parting beams.

MILMAN.

## LESSON XV.

### PALESTINE.

Reft of thy sons, amid thy foes forlorn,
Mourn, widow's queen! forgotten Zion, mourn!
Is this thy place, sad city, this thy throne,
Where the wild desert rears its craggy stone?

While suns unbless'd their angry lustre fling,
And the way-worn pilgrims seek the scanty spring?
Where now thy pomp, which kings with envy view'd?
Where now thy might, which all those kings subdued?
No martial myriads muster in thy gate.
No suppliant nations in thy temple wait;
No prophet-bards, the glittering courts among,
Wake the full lyre, and swell the tide of song;
But lawless Force and meagre want are there,
And the quick-darting eye of restless Fear,
While cold oblivion, 'mid thy ruins laid,
Folds his dank wing beneath the ivy shade.

HEBER.

## CHRIST'S SECOND COMING.

The Lord shall come! The earth shall quake,
The mountains to their centre shake;
And, withering from the vault of night,
The stars shall pale their feeble light.
The Lord shall come! a dreadful form,
With rainbow wreath and robes of storm;
On cherub wings, and the wings of wind,
Appointed Judge of all mankind.
Can this be He, who wont to stray
A pilgrim on the world's highway,
Oppressed by power, and mocked by pride,
The Nazarene,—the crucified?
While sinners in despair shall call,
" Rocks, hide us; mountains, on us fall!"
The saints, ascending from the tomb,
Shall joyful sing, " The Lord is come!

HEBER.

## LESSON XVI.

### THE SAVIOUR.

Hail to the Lord's Anointed,
Great David's greater Son,
Hail, in the time appointed,
His reign on earth begun.

He comes to break oppression,
To set the captive free;
To take away transgression,
And rule in equity.

He comes with succour speedy
To those who suffer wrong,
To help the poor and needy,
And bid the weak be strong;

To give them songs for sighing;
Their darkness turn to light;
Whose souls, condemn'd and dying,
Were precious in his sight.

By such he shall be fear'd
While sun and moon endure,
Beloved, obey'd, revered,
For he shall judge the poor.

Through changing generations,
With justice, mercy, truth,
While stars maintain their stations,
Or moons renew their youth.

He shall come down like showers
Upon the fruitful earth,
And love, joy, hope, like flowers,
Spring in his path to birth.

Before him on the mountains
Shall peace the herald go,
And righteousness in fountains
From hill to valley flow.

Arabia's desert ranger
To him shall bow the knee;
The Ethiopian stranger
His glory come to see.

With off'rings of devotion,
Ships from the isles shall meet,
To pour the wealth of ocean
In tribute at his feet.

Kings shall fall down before him,
And gold and incense bring;
And nations shall adore him;
His praise all nations sing:

For he shall have dominion
On river, sea, and shore;
Far as the eagle's pinion,
Or dove's light wing can soar.

For him shall prayers unceasing,
And daily vows ascend;
His kingdom still increasing,
A kingdon without end.

The mountain dews shall nourish
A seed in weakness sown,
Whose fruit shall spread and flourish,
And shake like Lebanon.

O'er every foe victorious,
He on his throne shall rest;
From age to age more glorious,
All blessing and all blest.

The tide of time shall never
The covenant remove;
His name shall stand for ever;
That name to us is love.

MONTGOMERY.

## LESSON XVII.

### THE INCARNATION.

For thou wast born of woman, thou didst come,
O Holiest! to this world of sin and gloom,
Not in thy dread-omnipotent array;
And not by thunders strew'd
Was thy tempestuous road;
Nor indignation burnt before thee on thy way.
But thee, a soft and naked child,
Thy mother, undefiled,
In the rude manger laid to rest
From off her virgin breast.

The heavens were not commanded to prepare
A gorgeous canopy of golden air;
Nor stoop'd their lamps th' enthroned fires on high;
A single silent star
Came wandering from afar,
Gliding uncheck'd and calm along the liquid sky.
The eastern sages leading on,
As at a kingly throne,
To lay their gold and odours sweet
Before thy infant feet.

The earth and ocean were not hush'd to hear
Bright harmony from ev'ry starry sphere;
Nor at thy presence break the voice of song.
From all the cherub choirs,
And seraph's burning lyres
Pour'd through host of heaven the charmed clouds along
One angel troop the strain began,
Of all the race of man,
By simple shepherds heard alone,
That soft hozanna's tone.

And when thou didst depart, no car of flame,
To bear thee hence, in lambent radiance came;
Nor visible angels mourn'd with drooping plumes:
Nor didst thou mount on high
From fatal Calvary
With all thine own outbursting from their tombs;
For thou didst bear away from earth
But one of human birth,
The dying felon by thy side, to be
In Paradise with thee.

Nor o'er thy cross did clouds of vengeance break ;
A little while the conscious earth did shake
At that foul deed by her fierce children done ;
A few dim hours of day,
The world in darkness lay,
Then bask'd in bright repose beneath the cloudless sun :
Whilst thou didst sleep beneath the tomb.
Consenting to thy doom,
Ere yet the white-robed Angel shone
Upon the sealed stone.

And when thou didst arise, thou didst not stand
With devastation in thy red right hand,
Plaguing the guilty city's murderous crew ;
But thou didst haste to meet
Thy mother's coming feet,
And bear the words of peace unto the faithful few :
Then calmly, slowly didst thou rise
Into thy native skies.

MILMAN

# SECTION IV.

## LESSON I.

### ON VALUE.

Gold and Silver are the most convenient metals to use as money, because they take up but little room in proportion to their value. Hence they are called the precious metals.

But why should Gold and Silver be of so much more value than Iron? For they are not nearly so useful. We should be very ill off without knives and scissors, and spades and hatchets; and these could not be made so well from any thing as from iron; and silver and gold would make very bad tools indeed.

To understand this, you must remember that it is not the most useful things that are of the most value. Nothing is more useful than air and water; without which we could not live. Yet these are in most places of no value, in the proper sense of the word; that is, no one will give anything in exchange for them, because he can have them without.

In some places, indeed, water is scarce; and then people are glad to buy it. You may read in Scripture of many quarrels that arose about wells of water; because in some of the Eastern countries, water is so scarce that a well is a very important possession. But water is not more *useful* in those places where people are glad to buy it, than it is here, where, by the bounty of Providence, it is plentiful. It is the *scarcity* that gives it value: and where iron is scarce, it is of great value.

Some islands which our ships have visited produce no iron; and the people there are glad to get a few nails in exchange for a hog. But, in most countries, iron, which is the most useful of all metals, is also, through the goodness of Providence, the most plentiful. But still it is of some value; because it must be dug from the mines, and smelted in furnaces, and wrought into tools, before we can make use of it. If knives and nails were produced by nature ready-made, and could be picked up every where like pebbles, they would be of no value, because every one might get them for nothing. But they would be just as useful as they are now.

Scarcity alone, however, would not make a thing valuable, if there were no reason why any one should *desire* to possess it. There are some kinds of stones which are scarce, but of no value, because they have neither use nor beauty. You would not give any thing in exchange for such a stone; not because you cannot easily get it, but because you have no wish for it.

But a stone which is scarce and very *beautiful* may be of great value, though it is of no *use* but to make an ornament for the person. Such are diamonds and rubies, and many others. Many people will work hard to earn money enough to buy not only food and necessary clothing, but also lace, and jewels, and other articles of finery.

And they desire these things the more, because, besides being beautiful to the eye they are reckoned a sign of wealth in the person who wears them. A bunch of wild flowers will often be a prettier ornament than a fine riband, or a jewel; but a woman likes better to wear these last, to show that she can afford the cost of them, whereas the wild flowers may be had for picking.

There is no harm in people's desiring to be well dressed according to their station in life; but it is a pity that so many should be fond of expensive finery above their station, which often brings them to poverty. And often they spend money on ornaments which would be better laid out in buying good useful clothes and furniture, and in keeping them clean. A mixture of finery with rags and dirt is a most disgusting sight.

You understand now, I hope, that whatever is of value must not only be *desirable* for its use or beauty, or some pleasure it affords, but also *scarce*; that is, so *limited* in supply that it is not to be had for nothing. And of all things which are desirable, those are the *most* valuable which are the most limited in supply; that is, the hardest to be got.

This is the reason why silver and gold are of more value than iron. If they had been of no use or beauty at all, no one would ever have desired them; but being desirable, they are of greater value than iron, because they are so much scarcer and harder to be got. They are found in but few places, and in small quantities. Gold, in particular, is obtained chiefly in the form of dust, by laborious washing of the sand of certain streams. It costs only as much in labour and other expenses to obtain fifteen pounds of silver as to obtain one pound of gold; and this is the cause that one pound of gold will exchange for about fifteen pounds of silver.

But besides being desirable and being scarce, there is one point more required, for a thing to have value; or, in other words, to be such that something else may be had in exchange for it. It must be something that you can *part with* to another person. For instance, *health* is very desirable, and is what every one cannot obtain; and hence we sometimes do speak of health as being of value; but this is not the strict use of the word value; for no one can give his health to another in exchange for something else. Many a rich man would be glad to give a thousand pounds, or perhaps ten thousand pounds, in exchange for the healthy constitution and strong limbs of a poor labourer; and, perhaps, the labourer would be glad to make such a bargain; but, though he might cut off his limbs, he could not make them another man's; he may throw away his health, as many do, by intemperance; but he cannot *transfer* it; that is, part with it to another person.

## LESSON II.

### ON VALUE—CONTINUED.

On these elementary points, such questions as the following may be usefully put to themselves by those to whom the subject is new:—

1. Why is air not an article of value?—Because, though it be very useful, it is to be *had for nothing*.

2. Why is some scarce kind of stone, that is of no use or beauty, not an article of value?—Because, though it be not a thing that every one can get, no one *desires* to get it.

3. Why is a healthy constitution not an article of value? —Because, though it be very desirable, and is not what every one can get, it is not *transferable*; that is, cannot be transferred, or parted with, by one person to another.

4. Why is a spade an article of value ?—because it is 1st, desirable, as being of use ; 2ndly, limited in supply, that is, it is not what every one can have for nothing ; and 3rdly, transferable, that is, one person can part with it to another.

5. Why is a silver spoon of more value than a spade ? —Because, though it be not more useful, it is more limited in supply or harder to be got, on account of the difficulty of working the mines of silver.

When any thing that is desirable is to be had by labour and is not to be had without labour, of course we find men labouring to obtain it ; and things that are of very great value will usually be found to have cost very great labour. This has led some persons to suppose that it is the labour which has been bestowed on any thing that *gives* it value ; but this is quite a mistake. It is not the labour which any thing has cost that causes it to sell for a higher price ; but, on the contrary, it is its selling for a higher price that causes men to labour in procuring it. For instance, fishermen go out to sea, and toil hard in the wet and cold to catch fish, because they can get a good price for them; but if a fisherman should work hard all night and catch but one small fish, while another had, perhaps caught a thousand, by falling in with a shoal, the first would not be able to sell his one fish for the same price as the other man's thousand, though it would have cost him the same labour. It has now and then happened that a salmon has leaped into a boat by chance ; but though this has cost no labour, it is not, for that reason the less valuable. And if a man, in eating an oyster, should chance to meet with a fine pearl, it would not sell for less than if he had been diving for it all day.

It is not, therefore, labour that makes all thing valuable, but their being valuable that makes them worth labouring for. And God having judged in his wisdom that it is not good for man to be idle has so appointed things by his providence, that few of the things that are most desirable can be obtained without labour. It is ordained for man to eat bread in the sweat of his face ; and almost all the necessaries, comforts, and luxuries of life are obtained by labour.

## LESSON III.

### ON WAGES.

Some labourers are paid higher than others. A carpenter earns more than a ploughman, and a watchmaker more than either: and yet this is not from the one working harder than the other.

And it is the same with the labour of the mind as with that of the body. A banker's clerk, who has to work hard at keeping accounts, is not paid so high as a lawyer or a physician.

You see, from this, that the rate of wages does not depend on the hardness of the labour, but on the *value* of the work done.

But on what does the value of the work depend ?

The value of each kind of work is like the value of any thing else; it is greater or less, according to the *limitation of its supply*; that is the *difficulty* of procuring it. If there were no more expense, time, and trouble in procuring a pound of gold than a pound of copper, then gold would be of no more value than copper.

But why should the supply of watchmakers and surgeons be more limited than of carpenters and ploughmen. That is, why is it more difficult to make a man a watchmaker than a ploughman?

The chief reason is, that the education required costs a great deal more. A long time must be spent in learning the business of a watchmaker or a surgeon before a man can acquire enough of skill to practise; so that unless you have enough to support you all this time and also to pay your master for teaching you the art, you cannot become a watchmaker or a surgeon: and no father would go to the expense of breeding up a son a surgeon or watchmaker even though he could well afford it, if he did not expect him to earn more than a carpenter, whose education costs much less. But sometimes a father is disappointed in his expectation. If the son should turn out stupid or idle, he would not acquire skill enough to maintain himself by his business; and then the expense of his education would be lost; for it is not the expensive education of a surgeon that causes him to be paid more for setting a man's leg, than a carpenter is for mending the leg of a table; but the expensive education causes fewer people to become surgeons. It causes the supply of surgeons to be more *limited*; that is, confined to a few; and it is this limitation that is the cause of their being better paid.

So that you see, the value of each kind of labour is higher or lower, like that of all other things, according as the supply is limited.

Natural genius will often have the same effect as the expensiveness of education, in causing one man to be better paid than another. For instance, one who has a natural genius for painting may become a very fine painter, though his education may not have cost more than that of an ordinary painter; and he will then earn perhaps, ten times as much without working any harder at his pictures than the other. But the cause why a man of natural genius is higher paid for his work than another is still the same. Men of genius are *scarce*; and their work, therefore, is of the more value, from being more limited in supply.

Some kinds of labour, again, are higher paid, from the supply of them being limited by other causes, and not by the cost of learning them, or the natural genius they require. Any occupation that is unhealthy, or dangerous, or disagreeable, is paid the higher on that account; because people would not otherwise engage in it. There is this kind of limitation in the supply of house-painters, miners, gunpowder-makers, and several others.

Some people fancy that it is unjust that one man should not earn as much as another who works no harder than himself. And there certainly would be a harship, if one man could *force* another to work for him at whatever wages he chose to give. This is the case with those slaves, who are forced to work, and are only supplied by their masters with food and other necessaries, like horses. So, also, it would be a hardship, if I were to force any one to sell me any thing, whether his labour or his cloth, or cattle, or corn, at any price I might choose to fix. But there is no hardship in leaving all buyers and sellers free; the one, to ask whatever price he may think fit; the other, to offer what he thinks the article worth. A labourer is a seller of labour; his employer is a buyer of labour: and both ought to be left free.

If a man choose to ask ever so high a price for his potatoes, or his cows, he is free to do so; but then it would be very hard that he should be allowed to force others to buy them, at that price, whether they would or no. In the same manner, an ordinary labourer may *ask* as high wages as he likes; but it would be very hard to *oblige* others to employ him at that rate, whether they would or not. And so the labourer himself would think, if the same rule were applied to him; that is, if a tailor, and a carpenter, and a shoemaker, could oblige him to employ them, whether he wanted their articles or not, at whatever price they chose to fix.

In former times, laws used to be often made to fix the wages of labour. It was forbidden, under a penalty, that higher or lower wages should be asked or offered, for each kind of labour, than what the law fixed. But laws of this kind were found never to do any good: for when the rate fixed by law for farm-labourers, for instance, happened to be higher than it was worth a farmer's while to give for ordinary labourers, he turned off all his workmen except a few of the best hands, and employed these on the best land only; so that less corn was raised, and many persons were out of work, who would have been glad to have it at a lower rate rather than earn nothing.

Then, again, when the fixed rate was lower than it would answer to a farmer to give to the best workmen, some farmers would naturally try to get these into their service, by paying them privately at a higher rate; and this they could easily do, so as to escape the law, by agreeing to supply them with corn at a reduced price, or in some such way; and then the other farmers were driven to do the same thing, that they might not lose all their best workmen; so that laws of this kind come to nothing.

The best way is to leave all labourers and employers, as well as all other sellers and buyers, free to ask and to offer what they think fit; and to make their own bargain together, if they can agree, or to break it off if they cannot.

But labourers often suffer great hardships, from which they might save themselves by looking forward beyond the present day. They are apt to complain of others, when they ought rather to blame their own imprudence. If, when a man is earning good wages, he spends all as fast as he gets it in thoughtless intemperance, instead of laying by something against hard times, he may afterwards have to suffer great want when he is out of work, or when wages are lower; but then he must not blame others for this, but his own improvidence. So thought the bees in the following fable:

"A grasshopper, half-starved with cold and hunger, at the approach of winter, came to a well-stored bee-hive, and humbly begged the bees to relieve his wants with a few drops of honey. One of the bees asked him how he had spent his time all the summer, and why he had not laid up a store of food like them? 'Truly,' said he, 'I spent my time very merrily, in drinking, dancing, and singing, and never once thought of winter.' 'Our plan is very different,' said the bee ; 'we work hard in the summer, to lay by a store of food against the season when we foresee we shall want it ; but those who do nothing but drink, and dance, and sing in the summer, must expect to starve in the winter.'"

## LESSON IV.

### RICH AND POOR.

Besides those who work for their living, some at a high rate and some at a lower, there are others who do not live by their labour at all, but are rich enough to subsist on what they, or their fathers, have laid up. There are many of these rich men, indeed, who do hold laborious offices, as magistrates and members of parliament. But this is at their own choice. They do not labour for their subsistence, but live on their property.

There can be but few of such persons compared with those who are obliged to work for their living. But though there can be no country where all, or the greater part, are rich enough to live without labour, there are several countries where all are poor ; and in those countries where all are forced to live by their labour, the people are much worse off than most of the labourers are in this country. In savage nations almost every one is half-starved at times, and generally half naked. But in any country in which property is secure, and the pepole industrious, the wealth of that country will increase; and those who are the most industrious and frugal will gain more than such as are idle and extravagant, and will lay by something for their children, who will thus be born to a good property.

Young people who make good use of their time, are quick at learning, and grow up industrious and steady, may, perhaps, be able to earn more than enough for their support, and so have the satisfaction of leaving some property to their children; and if they, again, should, instead of spending this property, increase it by honest diligence, prudence, and frugality, they may, in time, raise themselves to wealth. Several of the richest families in the country have risen in this manner from a low station. It is, of course, not to be expected that *many* poor men should become rich, nor ought any man to set his heart on being so; but it is an allowable and a cheering thought that no one is shut out from the hope of bettering his condition, and providing for his children.

And would you not think it hard, that a man should not be allowed to lay by his savings for his children? But this is the case in some countries where property is so ill secured, that a man is liable to have all his savings forced from him, or seized upon at his death; and there all the people are miserably poor, because no one thinks it worth his while to attempt saving any thing.

There are some countries which were formerly very productive and populous, but which now, under the tyrannical government of the Turks, or other such people, have become almost deserts. In former times Barbary produced silk, but now most of the mulberry trees (on whose leaves the silk-worms are fed) are decayed; and no one thinks of planting fresh trees, because he has no security that he shall be allowed to enjoy the produce.

Can it be supposed that the poor would be better off if all the property of the rich were taken away and divided among them, and no one allowed to become rich for the future? The poor would then be much worse off than they are now; they would still have to work for their livings as they do now; for food and clothes cannot be had without *somebody's* labour. But they would not work near so profitably as they do now, because no one would be able to keep up a large manufactory or farm well stocked, and to advance wages to workmen, as is done now, for work which does not bring in any return for, perhaps, a year or two. Every man would live, as the saying is, "from hand to mouth," just tilling his own little patch of ground, enough to keep him alive, and not daring to lay by any thing, because if he were supposed to be rich, he would be in danger of having his property taken away and divided.

And if a bad crop, or a sickly family brought any one into distress, which would soon be the case with many, what could he do after he had spent his little property? He would be willing to work for hire, but no one could afford to employ him except in something that would bring in a very speedy return; for even those few who might have saved a little money would be afraid to have it known, for fear of being forced to part with it. They would hide it somewhere in a hole in the ground, which used formerly to be a common practice in this country, and still is in some others, were property is very scarce.

Under such a state of things the whole country would become poorer and poorer every year ; for each man would labour no more than just enough for his immediate supply ; and would also employ his labour less profitably than now, for want of a proper division of labour ; and no one would attempt to lay by any thing, because he would not be sure of being allowed to keep it. In consequence of all this, the whole produce of the land and labour of the country, would become much less than it is now ; and we should soon be reduced to the same general wretchedness and distress which prevails in many half-savage countries. The rich, indeed, would have become poor ; but the poor, instead of improving their condition, would be much worse off than before. All would soon be as miserably poor as the most destitute beggars are now : indeed, so far worse, that *there would be nobody to beg of.*

It is best for all parties, the rich, the poor, the middling, that property should be secure, and that every one should be allowed to possess what is his own, to gain whatever he can by honest means, and to keep it or spend it as he thinks fit,—provided he does no one any injury. Some rich men, indeed, make a much better use of their fortunes than others : but one who is ever so selfish in his disposition can hardly help spending it on his neighbours. If a man has an income of £5000 a-year, some people might think, at first sight, that if his estate were divided among one hundred poor families, which would give each of them £50 a-year, there would thus be, by such a division one hundred poor families the more enabled to subsist in the country. But this is quite a mistake. Such would, indeed, be the case if the rich man had been used to eat as much food as one hundred poor families, and to wear out as much clothes as all of them. But we know this is not the case. He pays away his income to servants, and labourers, and tradesmen, and manufacturers of different articles, who lay out the money in food and clothing for their families; so that in reality, the same sort of division of it is made as if it had been taken away from him. He may, perhaps, if he be a selfish man, care nothing for the maintaining of all these families; but still he does maintain them; for if he should choose to spend £1000 a-year in fine pictures, the painters who are employed in those pictures are as well maintained as if he had made them a present of the money, and left them to sit idle. The only difference is, that they feel they are honestly earning their living, instead of subsisting on charity; but the total quantity of food and clothing in the country is neither the greater nor the less in the one case than in the other. But if a rich man, instead of spending all his income, saves a great part of it, this saving will almost always be the means of maintaining a still greater number of industrious people: for a man who saves, hardly ever, in these days at least, hoards up gold and silver in a box, but lends it out on good security, that he may receive interest upon it. Suppose, instead of spending £1000 a-year on painting, he saves that sum every year. Then this money is generally borrowed by farmers, or manufacturers, or merchants, who can make a profit by it in the way of their business, over and above the interest they pay for the use of it. And in order to do this, they lay it out in employing labourers to till the ground, or to manufacture cloth and other articles, or to import foreign goods; by which means the corn, and cloth, and other commodities of the country, are increased.

The rich man, therefore, though he appears to have so much larger a share allotted to him, does not really consume it, but is only the channel through which it flows to others. And it is by this means much better distributed than it could have been otherwise.

The mistake of which I have been speaking of, supposing that the rich cause the poor to be the worse off, was exposed long ago in the fable of the stomach and the limbs:—

"Once on a time," says the fable, "all the other members of the body began to murmur against the stomach, for employing the labours of all the rest, and consuming all that they had helped to provide, without doing any thing in return. So they all agreed to strike work, and refused to wait upon this idle stomach any longer. The feet refused to carry it about; the hands resolved to put no food into its mouth for it; the nose refused to smell for it, and the eyes to look out in its service; and the ears declared they would not even listen to the dinner-bell and so of all the rest. But after the stomach had been left empty for some time, all the members began to suffer. The legs and arms grew feeble; the eyes became dim, and all the body languid and exhausted.

"Oh, foolish members," said the stomach, you now perceive that what you used to supply to me, was in reality supplied to yourselves. I did not consume for myself the food that was put into me, but digested it, and prepared it for being changed into blood, which was sent through various channels as a supply for each of you. If you are occupied in feeding me, it is by me in turn, that the blood-vessels which nourish you are fed."

You see, then that a rich man, even though he may care for no one but himself, can hardly avoid benefitting his neighbours. But this is no merit of his, if he himself has no desire or wish to benefit them. On the other hand, a rich man who seeks for deserving objects to relieve and assist, and is, as the Apostle expresses it, "ready to give, and glad to distribute, as laying up in store for himself a good foundation for the time to come, that he may lay hold on eternal life." It is plain, from this, and from many other such injunctions of the Apostles, that they did not intend to destroy the security of property among Christians, which leads to the distinction between the rich and the poor; for their exhortations to the rich, to be kind and charitable to the poor would have been absurd if they had not allowed that any of their people should be rich; and there could be no such thing as charity in giving any thing to the poor, if it were not left to each man's free choice, to give or spend what is his own. Indeed, nothing can be called your own which you are not left free to dispose of as you will. The very nature of charity implies that it must be voluntary; for no one can be properly said to *give* any thing that he has no power to withhold. The Apostle Paul, indeed, goes yet farther, when he desires each man "to *give* according as he is disposed in his heart, and not grudgingly," because God loveth the cheerful giver."

When men are thus left to their own inclinations, to make use of their money, each as he is disposed in his heart, we must expect to find that some will choose to spend it, merely on their own selfish enjoyments. Such men, although, as you have seen, they do contribute to maintain many industrious families without intending it, yet are themselves not the less selfish and odious. But still we are not the less forbidden to rob, or defraud, or annoy them. Scripture forbids us to " covet our neighbour's goods," not because he makes a right use of them, but because they are *his*.

When you see a rich man who is proud and selfish, perhaps you are tempted to think how much better a use you would make of wealth if you were as rich as he. I hope you would: but the best *proof* that you can give, that you would behave well if you were in *another's* place, is by behaving well in *your own*. God has appointed to each his own trials, and his own duties; and He will judge you, not according to what you think you would have done in some different station, but according to what you *have* done, in that station in which He has placed you.

## LESSON V.

### ON CAPITAL.

We have seen that a rich man who spends on himself his income of £1000 or £10,000 a-year, does not diminish the wealth of the whole country by so much; but only by what he actually eats and wears, or otherwise consumes himself. The rest he hands over to those who work for him or wait on him; paying them either in food or clothes, or what comes to the same thing, in money, to buy what they want. And if he were to *give* to the same persons what he now pays, leaving them to continue idle, there would not be the more food or clothes in the country; only, these people would sit still, or lounge about and do nothing, instead of earning their bread.

But they are the happier and the better for being employed instead of being idle, even though their labour should be only in planting flowers or building a palace to please their employer's fancy.

Most of the money that is spent, however, is laid out in employing labourers on some work that is *profitable*; that is, in doing something which brings back more than is spent on it, and thus goes to increase the whole wealth of the country. Thus, if, instead of employing labourers to cultivate a flower-garden or build me a summer-house for my pleasure, I employ them in raising corn, or building a mill to grind it, the price of that corn, or the price paid for grinding by those who bring corn to the mill, will be more (if I have conducted the business prudently) than what I had spent on those works. So that instead of having parted with my money for ever, as when it is spent on a pleasure-garden or summer-house, it comes back to me with addition. This addition is called profit; and the money so laid out is called capital.

A man who lays out his money in this manner, may do the same over again, as soon as it comes back to him; so that he may go on supporting labourers year after year. And if he saves each year a part of his profit, and adds it to his capital as a thriving farmer or manufacturer generally does, he will be continually employing more and more labourers, and increasing the wealth of the country, He himself, indeed, is perhaps not thinking of his country, but is only seeking to enrich himself: but this is the best and surest way he could take for enriching his country; for every man in the nation who adds to his own wealth, without lessening the wealth of others must, it is plain, be adding just so much to the wealth of the nation. Sometimes, indeed, one man gains by another's loss; and then, of course, nothing is added to the wealth of the country. If a man gets rich by gambling, or begging, or robbery, others loose at least as much as he gains: but if he gets rich by his skill in farming or manufactures, or mining, all that he gains is so much added to the wealth of the whole country, since it is not lost by any one else.

Many persons dispose of their property in this way, though they are not themselves engaged in business, but lend their money to others who are. Suppose you were a labouring man, and had £100 left you as a legacy; or had saved up that sum from your earnings: you might not know how to trade with the money to advantage; and if you keep it in a strong box, for the use of your children, you would not be the better for it all your life; and at the end of twenty or thirty years, your children would find just the same sum that you first put in. Or if you took out £5 every year to spend, at the end of twenty years it would be all gone. But you might lend it to some person engaged in business, who would give you security for the repayment of the principal, as it is called, that is, the sum borrowed, and would pay you £4 or £5 every year for the use of it; which is called interest. This he would be glad to do, if he knew that he could employ this £100 in buying materials, and paying workmen, to weave cloth, for instance, or make tables and chairs; which would bring in, by the end of the year, £110; for out of this increase of £10, after paying you £5 for the use of your money he would have gained £5 for himself.

In this way, a great part of the capital that is engaged in trade and manufactures, is employed by persons who are not themselves the owners of it.

The more capital there is in the country, the better for the labourers; for the poorer the master is, the fewer labourers he can afford to employ, and the less sure he can be of being able to pay them.

Suppose you were a poor man, in a newly-settled country, and asked your neighbour to help you to dig a piece of fertile ground, promising him a share of the produce for his pains; he might say, I have nothing to live on in the mean time; if you want me to dig for you, you must pay me daily wages. But if you have nothing beforehand, except bare necessaries for yourself,—that is, if you have no capital,—you cannot pay him till harvest. Your land, therefore, will remain half-tilled, and he will be forced to go into the woods to seek for wild berries, or to hunt and fish, to provide himself food. Indeed, *all* would be forced to *begin* in this manner, if you suppose a number of men left to themselves, even on the most fertile land, without any property to set out with,—that is, without capital. They would have great difficulties to struggle against for a long time; but when they had advanced some way in acquiring wealth, they would find it easier to obtain more.

For, as it is, you may observe that wealth is always obtained by means of wealth,—that is, it is gained by the help of capital; without which labour can hardly be carried on. Corn is raised by labour; but a previous stock of corn is needed, both to sow the ground, and to maintain the labourer till the harvest is ripe. The tools with which he works are made with tools. The handle of the axe with which he cuts wood is made of wood; the iron of it was dug from the mine with iron instruments; and it is the same with almost every kind of labour. You may judge, therefore, how difficult and slow men's first advances must have been, when they had to work with their bare hands or with stakes and sharp stones for their tools.

Accordingly, in countries that are ill-provided with capital, though the inhabitants are few in number, and all of them are forced to labour for the necessaries of life, they are worse fed, clothed, and lodged, than even the poorest are in a richer country, though that be much more thickly peopled, and though many of the inhabitants of it are not obliged to labour with their hands at all.

The money, food, and other things which a farmer spends on the labourers and on the horses which cultivate his land, or a clothier on his weavers, is called *circulating* capital; because he parts with it from time to time, and it returns to him as in a circle, in the shape of corn or cloth. The farmer's barns, ploughs, carts, and horses, and the clothier's looms and warehouses, are called *fixed* capital; because they bring in a profit, not by being parted with, but by being kept as long as they are fit for use.

Any new kind of tool or machine, by enabling a few men to do the work of many, is likely when first introduced, to throw several men out of employment: but, in the end, it almost always finds employment for many more. Thus, for instance, when the art of printing was first introduced, many who used to gain their living by copying were thrown out of employment, because a very few printers could produce as many copies of a book as severel hundred writers. But in a short time books being thus rendered so much cheaper, many more were enabled to buy them; and many hundred times as many printers were employed as there were copyers before. And the same thing takes place in almost every kind of machinery.

There is one way of employing capital, which people are apt to murmur at as if it did them an injury, though there is none that does more important service to the public. A man who deals in corn or other provisions, is, of course, watchful to buy them up when they are cheap, and to keep them till they are dearer, that he may sell them at a profit. Now, an unthinking person is apt to complain of corn-dealers when bread is dear, as if they were the cause of scarcity; but, in truth, it is they that preserve us from being absolutely starved, whenever there happens to be a scanty harvest. Not that a corn-dealer is thinking of benefiting the public, he is only thinking of gaining for himself a profit on his capital, like any other tradesman; but the way he takes to secure this profit, which is by buying up corn when it is cheap and selling it when dear, is exactly the way in which the plentiful crop of one year may supply the defect ot another, so that there may not be first waste and then famine, and in which a short supply may be made to hold out.

When the captain of a ship finds his provisions run short, so that there is not, suppose, above three weeks' provisions on board, and his voyage is likely to last four, he puts the crew on short allowance ; and thus, by each man's submitting to eat only three-fourths of his usual quantity, the provisions hold out. But if the crew should mutiny when they felt hungry, and insist on having their full allowance, then by the end of three weeks, all would be consumed, and they would perish with hunger. Now, it is plain that the same would be the case with the whole nation, if, when the harvest fell short, all were to go on at the ordinary rate of consumption.

Suppose such a failure in the crops that all the corn in the country was only enough for three quarters of a year, according to the common rate of consumption, it is plain that if all men went on eating the usual quantity, there would be nothing left for the last three months, and the most dreadful famine would prevail.

How is this to be prevented, as there is no captain to put people on short allowance ; and is it not to be expected that all should agree, each to stint himself for the public good ? If corn remained at the usual price, all would continue to eat the usual quantity till there was none left. But the prospect of a scarcity causes farmers and millers, and others, who have capital, to keep what corn they have by them, in expectation of a higher price, and to buy up what they can at home and from abroad ; and, as they refuse to sell it except at an advanced price, in proportion to the scarcity, the dearness of food forces people to be more saving. In this way the store of provisions is husbanded in the whole country, just as on board a ship and is made to last till next harvest; and thus by suffering a certain degree of hardship, the people are saved from perishing by famine.

It is curious to observe, how, through the wise and beneficent arrangement of Providence, men thus do the greatest service to the public when they are thinking of nothing but their own gain. And this happens not only in the case of corn-dealers, but generally. When men are left quite free to employ their capital as each thinks best for his own advantage, he will almost always benefit the public, though he may have no such design or thought.

## LESSON VI.

### ON TAXES.

We read in Scripture, (Nehemiah iv. 17.) that when the Jews returned from the captivity, and began to rebuild the walls of their city, they were so beset by enemies that they were forced to be constantly armed and on their guard; and, for fear of a sudden attack, each man worked with one hand only, and the other hand held a weapon ready. In this way it would take at least two men to do the work of one. But the danger they were in obliged them to put up with this inconvenience.

Many countries in the East are to this day nearly in the same condition. They are so infested by robbers, chiefly Arabs, always roaming about in search of plunder, that no man can hope to escape being robbed unless he is well armed and on his guard. Travellers tell us that when a husbandman goes to sow his fields, he takes with him a companion with a sword or a spear, to protect him from being robbed of his seed-corn. This must make the cultivation of the ground very costly, because the work which might be done by one man requires two; one to labour and the other to fight; and both must have a share of the crop which would otherwise belong to one. And after all, the protection of property must be very imperfect, for you may suppose the robbers will often come in such force as to overpower the defenders, and plunder the industrious of all the fruits of their labour. Accordingly, in these countries, there is very little land cultivated. Most of it lies waste; the inhabitants are few; not one-twentieth of what the land could maintain; and these few are miserably poor. And all this is owing to the insecurity of property.

And the same is the case in all countries where the people are savages or nearly savages. Most of the time, and labour and care of a savage, is taken up in providing for his defence. He is occupied in providing arms for his protection against those whom he is able to fight; or in seeking hiding-places from those who are too strong for him. In the islands of New Zealand, several families are obliged to join together, and build their little cabins on the top of a steep rock, which they fence round with a trench, and sharp stakes, to protect them against their neighbours of the next village; and, after all, they are often taken by surprise, or overpowered. In such countries as that, there are a hundred times as many people killed every year, in proportion to their numbers, as in any part of Europe. It is true that there is not so much property lost, because there is very little to lose ; for people must be always exceedingly poor in such countries. In the first place, above half their time and labour is taken up in providing for their safety ; and, in the next place, this is so imperfectly done after all, that they can never be secure of the fruits of their industry.

The remedy for this miserable state of things is to be found in settled government. The office of a government is to afford protection ; that is to secure the persons and property of the people from violence and fraud. For this purpoe it provides ships of war, and bodies of soldiers to guard against foreign enemies, and against pirates, bands of robbers, or rebels ; and also provides watchmen, constables and other officers to apprehend criminals ; judges and courts of justice for trials ; and prisons for confining offenders ; and, in, short, every thing that is necessary for the peace and security of the people.

The expenses of the army and navy, and of every thing that government provides, are paid by the people ; and it is but fair that we should pay for all these things, since they are for our benefit. We pay taxes and government duties for these purposes. Taxes are the price people pay for being governed and protected. They correspond to the hire which the husbandman, in eastern countries, must pay to his companion who carries the spear or sword to guard him from robbers.

Some people do not understand this, or do not recollect it. Many are apt to think taxes quite a different kind of expense from all others ; and either do not know, or else forget that they receive any thing in *exchange* for the taxes. But, in reality, this payment is as much an exchange as any other. You pay money to the baker and butcher for feeding you, and the tailor for clothing you: and you pay the king and parliament for protecting you from being plundered, murdered, or cheated. Were it not for this, you could be employed scarcely half your time in providing food and clothing, and the other half would be taken up in guarding against being robbed of them; or in working for some other man whom you would hire to keep watch and to fight for you. This would cost you much more than you pay in taxes; and yet you may see, by the example of savage nations, how very imperfect that protection would be. Even the very worst government that ever was, is both much better and much cheaper than no government at all. Some of the Roman emperors were most detestable tyrants, who plundered and murdered great numbers of innocent men; yet even under their reigns there were not so many of their subjects (in proportion to their numbers) plundered or murdered, in ten years as there are among the New Zealanders, and other savage tribes in one year.

## LESSON VII.

### ON TAXES—CONTINUED.

You understand, now, that taxes are the hire or price paid to government, in exchange for protection; just as any other payment is made in exchange for any thing we want.

There is however, one important difference; that other payments are left to each man's choice ; but every one is *obliged* to pay the taxes. If I do not choose to buy shoes of a shoemaker, but to make shoes for myself at home, or to go without them, I am at liberty to do so ; and the same with other such payments. But it is not so with the payments to government. If any one should say, "I choose to protect my own person and property myself, without any assistance from soldiers, or sailors, or constables, or judges, and therefore I will not pay taxes ;" the answer would be : "Then go and live by yourself, in the wilds of America, or in some such country ; or join some tribe of wild Indians, and live as they do ; but while you live with *us*, in a country which has a government, you cannot even if you wish it, avoid partaking of the protection of government. The fleets and armies, which keep off the foreign enemies from plundering the country, are a defence to you as well as to us ; you are protected, as well as we, by the laws and officers of justice, from the thieves and murderers, who would otherwise be let loose on society. Since, therefore, the government must, whether it will or no, afford you a share of its protection, it is fair that you should be obliged, whether you will or no, to pay your share of its expenses. But if you are so foolish as not to like this bargain, you must leave the country, and go and live somewhere else in the wilderness."

It is quite fair, then, that as long as a man lives in any country, he should be obliged to submit to the government, and to pay the taxes ; and how much each shall pay is determined by the government. There is one great difference between this exchange and all others ; when you hire a man to work for you, you make your own bargain with him; and if you and he cannot agree as to the rate of payment, you will employ some one else instead. But the government of any country, whether it be a King, or a President, or a Senate, or Parliament, or, in short, whatever kind of government it is, must always have *power* to make all the people submit: since otherwise it could not perform the office of protecting them. It is not left to each person's choice, therefore, how much he shall pay for his protection; but government fixes the taxes, and enforces payment of them.

Many governments have made a bad use of this power, and have forced their subjects to pay much more than the reasonable expenses of protecting and governing the country. In some countries, and in this among others, the people are secured against this kind of ill-usage by choosing their own governors; that is, the Members of Parliament, without whom no laws can be made or taxes laid on.

It is very right to require that the public money should not be wastefully spent, and that we should not be called on to pay more than is necessary. But many persons are not so thankful as they ought to be for the benefits which they enjoy, in living under the protection on a government, because they do not know, or do not consider, the wretched condition of those who are without any regular government. Of all the commodities we pay for, there is none so cheap, compared with what it would cost us to provide ourselves with it, as the protection which is afforded us by government. If we all made clothes and shoes for ourselves, instead of buying them of the tailor and shoemaker, our clothes and shoes would, indeed, be much worse than they are, and would cost us much more.

But we should be far worse off still, if each of us had to provide by himself for the defence of his own person and property. Such protection as he would be thus able to obtain, would cost a great deal, and be worth very little.

## LESSON VIII.

### ON TAXES—CONTINUED.

Much the greatest part, however, of the taxes that are paid, goes to the expenses, not of the present year, but of past years; that is, to pay the interest on the National Debt. During our long and costly wars, much more was spent in each year than could be raised by taxes. Government, therefore, borrowed money of rich merchants, and others, engaging to pay interest on this till it should be repaid which most of it has not been, and perhaps never will be. The lenders therefore, received in exchange for their money, annuities; that is, a right to receive so much a year out of the taxes raised by Government; and these annuities, which we call Government securities, or property in the funds, may be sold by one person to another, or divided among several others, just like any other property. When a poor man has saved up a little money, he generally puts it into the funds, as it is called, or deposits it in a Savings' Bank, which does this for him; he is then one of the Government creditors, and receives his share of the taxes. You see, therefore, that if the national debt were abolished by law, without payment, many even of the labouring classes, would lose their all; and the English nation would not be relieved of the burthen; since it would be only robbing one set of Englishmen for the benefit of another set.

We may be sorry that so much money was formerly spent on gunpowder, which was fired off, and on soldiers' coats and ships, which were worn out; but nothing we can now do can recall this, any more than last year's snow. The expense is over and past, and the taxes raised to pay the interest of the money borrowed, are not so much lost to the country, but only so much shifted from one to another. All of us contribute to pay this in taxes: and all government creditors, that is, all who have money in the funds, or the savings' banks, receive their share of it, as a just debt. Thus the taxes find their way back into many a poor man's cottage who never suspects it.

I have said that far the greater part of taxes are raised for this purpose; that is, for paying the interest of the National Debt. The following calculation will make this clear to you; every twenty shillings paid in taxes are disposed of in about this proportion:—

| | | *s.* | *d.* |
|---|---|---|---|
| Expenses of the Army, Navy, &c. | | 7 | 2 |
| King, Judges, Ministers of State and other public officers. Pensions and Sinecure places, *i. e.* those that have no duties belonging to them | Civil List | 0 | 10 |
| Interest of the National Debt, | | 12 | 0 |

## LESSON IX.

### LETTING AND HIRING.

When one man parts *entirely* with any thing that belongs to him, to another person, and receives payment for it, this transaction is called, as you know, *selling* and *buying*. When he parts with it *for a time* only, that is, *lends* it to another, and receives payment for this, the transaction is commonly called *letting* and *hiring*.

But there are various words used to express this kind of dealing. When any one allows me for a certain price, the use of his coach, ship, or horse, this price is called *hire*. And so also if he lets me *himself*, that is his labour, to wait on me or work for me, I am said to hire him; and the payment he receives is sometimes called hire, though more commonly *wages*. But if, instead of a carriage or a horse he lets me a house or garden, the price I pay him is called *rent*. And if he allows me the use of his money, the price I pay for the loan of it is called *interest*. Now, though these different words are thus employed, you are not to suppose that they signify so many different kinds of transactions. If you consider attentively what is meant by the words Rent, Hire, and Interest, you will perceive that they all in reality signify the same sort of payment. It is only the fashion of the language to employ these different words, according to the different kinds of articles that are lent.

The Israelites were forbidden, in the law of Moses, to lend to their brethren on usury, that is interest, as they were not designed to be a trading people, but to live chiefly on the produce of their own land, as they were not likely to have any considerable money transactions together, and would seldom have occasion to borrow, except when one of them happened to fall into distress; and then his brother Israelites were expected to assist him freely, out of brotherly kindness and friendship; as is becoming in members of the same family. For they were all descended from twelve brothers, the sons of Jacob, who was also called Israel, and from whom they took their name: and they were commanded to consider each other as brethren.

But they were allowed by God's law to receive interest on the loan of money, or of any thing else lent, to a stranger; that is, any one besides the Israelites. And this shows that there can be nothing wrong in receiving interest, or any other kind of hire; for the law expressly charges them not to oppress or wrong the strangers, but to treat them not only justly, but kindly and charitably.

I have said that there is no real difference between paying for the loan of money, and for the loan of any thing else. For suppose I have £100 lying by me, you will easily see that it comes to the same thing, whether I buy a house or a piece of land with the money, and let it to my neighbour at so much a-year, or whether I lend him the money to buy the house or the land for himself, on condition of his paying me so much a year for the use of my money. But in the one case his yearly payment will be called rent, and in the other case it gets the name of interest.

## LESSON X.

### LETTING AND HIRING—CONTINUED.

Every man ought to be at liberty to sell, let, or use in any way he likes best, his house, or land, or any thing that is his property. There are some countries in the world, indeed, inhabited by half-savage tribes, such as the Tartars, where land is not private property, but is all one great common on which every man turns out his cattle to feed. These people, of course, lead a wandering life, dwelling in tents, and removing from place to place, in search of fresh pasture. And the land, as you may suppose, is never cultivated; as no one would think of sowing seed, when another might reap the harvest.

There are other countries, again, where any man may keep possession of a piece of ground which he has ploughed and sown till he has gathered in the crop; but as soon as ever it is out of his occupation, any one else is free to take possession of it. This is the case in many parts of Arabia at this day; and such seems to have been the state of many parts of the land of Canaan while Abraham and Isaac dwelt there. (See Gen. xxvi. 12, and Acts vii. 5.)

But, it is plain, that in such a state of things it would not be worth any one's while to spend money in fencing, draining, and manuring the land; because he would know that if he were disabled by sickness from continuing to cultivate it, or if he died leaving young children, it would pass into other hands, and all he had spent would be lost to him.

In order, therefore, that the land should be properly cultivated, it must be private property: and if a piece of land is your property you ought to be at liberty to dispose of it like any other property; either to sell it or to cultivate it yourself, or to employ a bailiff and labourers to cultivate it for you, or let it to a farmer.

When land is scarce in proportion to the number of people, in any country, the hire, or rent, as it is called, which the farmer pays for the use of it, will be the greater. The reason of this is very simple, and easy to be understood. The price of land, either to buy or to hire, increases, like the price of every thing else, in proportion to the scarcity of it, compared with the number of those who want it, and can afford to pay for it. When horses are scarce, in proportion to those who want them, and can afford to pay for them, the price of the hire of a horse increases. And so it is with every thing else, and with land among the rest. A farmer *desires* land, because he hopes to make a profit by raising corn and other crops from it; and he consents to *pay* rent for it, because he cannot obtain land without. And so it is with every thing that we buy or hire. We consent to pay for it as much as we think it worth to us, when we desire to have it, and cannot obtain it *without* that payment. Land is *desired*, therefore, on account of the crops that may be raised from it; and rent is *paid* for it, because it cannot be had without rent. You may have land for nothing in the Arabian deserts; but no one desires it there, because it will produce nothing. But again, in many of the uncleared parts of America, land may be had for nothing, though the soil is good and will bear plentiful crops. But there the land is so abundant, and the people so few, that any one may have as much as he chooses to clear. In this country, therefore, land that will produce any crops is of *value*, because the supply of it is limited; in the wilds of America, it is of no value; not because (like the Arabian deserts) it will produce nothing, but because, though it is very fertile, there is enough and much more than enough, for every one who wants it. But even in the newly-settled parts of America, the land becomes of some value, as soon as it is cleared of wood, and has roads made through or near it. And many persons are willing to buy, or to pay rent for such land, even when they might have land for nothing in the depth of the forests. But then they would have to clear the ground of trees and would be obliged to send perhaps some hundreds of miles to a market, to sell the corn and to buy what they wanted.

But as land grows scarcer, in proportion to the number of people, that is as the people multiply, the owners of it find that they can obtain a higher and higher rent. This, as I have explained, is because every thing that is useful becomes an article of *value*, that is, will fetch a *price*, when it is limited in quantity.

Some persons fancy that the reason why land fetches a rent, is because the food, and other things produced by land, afford the necessary support of man's life. But they do not consider that air, which we do not pay for, is as necessary to life as food; and that no one would pay for any thing which he might have without payment. If good land were as abundant in this country, in proportion to the people, as it is in some of the wilds of America, every one might take as much as he pleased for nothing. It would produce corn and other necessaries, as it does now; yet he would pay nothing but the labour of cultivation. Here, on the contrary, the only kind of land for which no one would pay rent is that which will produce nothing and is of no use at all; like the shingles of the beach on many parts of the coast. However *scarce* land (or any other article) may be, no one will pay for that which is *useless*; and, however *useful* it may be, he will not pay for that which is so *plentiful* as to be had for nothing. As was explained in a former Lesson, the value of any thing is not caused by its *scarcity alone*, or by its *usefulness alone*, but by both together.

Some, again, fancy that the rent is paid on account of the expense which the owner of the soil (or landlord as he is called) has laid out in enclosing the land, manuring it, and bringing it into cultivation. And most of our land, certainly has in this way cost the landlord a great expense, which he would not have bestowed, if he had not expected to be repaid by the rent. But it is not this expense that is the cause of the rent's being paid. For if he had laid out ever so much in trying to improve the land, still if he did not bring it to produce the more, he would not obtain the higher rent. And, on the other hand, though your land may have cost you nothing, still, if it will produce anything, and there is not enough of it for every body you may always obtain a rent for it. There are chalk downs, and other hilly pastures of great extent, in some parts of this country, which have never had any expense laid out on them. But they naturally produce grass for sheep; and farmers accordingly pay rent for them.

Again, there are on some parts of the coast, rocks which are bare only at low water, and are covered by the sea at every tide. On these there grows naturally a kind of sea-weed called kali, or kelp, which is regularly cut and carried away to be dried and burnt, for the sake of the ashes, used in making soap and glass. These rocks are let by the owners of them to those who make a trade of gathering this kelp for sale. Now, you see by this, that rent cannot depend on the land's producing food for man, or on the expenses laid out in bringing it into cultivation. For there is rent paid for these rocks, though they produce no food, and though they never have been, or can be cultivated.

Sometimes, again, rent is paid for a piece of ground on account of its *situation*, even though nothing grows on it. A fisherman, for instance, may be glad to rent a piece of the sea-beach, in a spot where it is convenient for him to draw up his boat, and spread his nets to dry, and build his cottage and store-houses.

## LESSON XI.

### LETTING AND HIRING—CONTINUED.

Some persons are apt to think that a high price of corn, and other provisions is caused by high rents; but this is quite a mistake. It is not the high rent of land that causes the high price of corn; but, on the contrary, the high rent of land is the effect of the high price of the corn and other things produced by the land. It is plain that rents do not lessen the supply of corn, and the price of corn depends on the supply brought to market, compared with the number of people who want to buy. Suppose all landlords were to agree to lower their rents one-half, the number of acres of land, and the quantity of corn raised, would remain the same, and so would the number of mouths that want corn. The farmer, therefore, would get the same price for his corn as he does now; the only difference would be, that he would be so much the richer, and the landlord so much the poorer: the labourers, and the rest of the people, would be no better off than before.

But some persons say, that if rents were lower, the farmers could afford to pay higher wages to their labourers; but those who talk so, confound together a *payment* and a *gift*. Wages are a payment for the use of a man's labour for a certain time: and as long as the price of corn remains the same, the day's work of the thrasher would not be *worth more* to the farmer who employs him, on account of the farmer's having become a richer man than formerly. No doubt, the richer any one is, the better he can afford to bestow a *gift*, if he is disposed to do so, either on his labourers, or on the tradesmen he deals with, or on any of his neighbours. But a pair of shoes is not worth the more to him on account of his being rich though he can afford, if he thinks fit, out of kindness and charity, to make the shoemaker a present of double the price of them; and so also a day's work in thrashing or ploughing, is not worth the more to him on account of his being richer, though he may choose to bestow a gift on the thrasher or ploughman. It is plain, therefore, that making farmers richer and landlords poorer, would make no change in what is *paid* as wages. The farmer would have more to *give*, if he were disposed to give away his money; and the landlord would have less; but there is no reason to suppose that more would be given away altogether than there is now.

And if all rents were to be entirely abolished, and every farmer were to keep the land he now occupies, without paying any thing for it, this would only be taking away the land from one man to give it to another: the one would be robbed and the other enriched, but the supply of corn, and the price of it, would not be altered by such a robbery. Or, again, if you were to make a law for lowering rents, so that the land should still remain the property of those to whom it now belongs, but that they should not be allowed to receive more than so much an acre for it; the only effect of this would be, that the landlord would no longer let his land to a farmer, but would take it into his own hands, and employ a bailiff to look after it for him.

This is a very common practice in some countries abroad; but the land is seldom so well cultivated on that plan, as when it is let to a farmer who had been bred to the business, and whose livelihood depends on his making the most of his farm.

## LESSON XII.

### DIVISION OF LABOUR.

Observe the accommodation of the most common artificer or day-labourer, in a civilized and thriving country, and you will perceive that the number of people, of whose a industry part, though but a small part, has been employed in procuring him his accommodation, exceeds all computation. The woollen coat, for example, which covers the day-labourer, coarse and rough as it may appear, is the produce of the joint labour of a great multitude of workmen. The shepherd, the sorter of the wool, the wool-comber or carder, the dyer, the spinner, the weaver, the fuller, the dresser, with many others, must all join their different arts, in order to complete even this homely production How many merchants and carriers, besides, must have been employed in transporting the materials from some of those workmen to others who often live in a very distant part of the country! How much commerce and navigation in particular, how many shipbuilders, sailors, sail-makers, rope-makers, must have been employed, in order to bring together the different drugs, made use of by the dyer, which often come from the remotest corners of the world! What a variety of labour, too, is necessary, in order to produce the tools of the meanest of those workmen! To say nothing of such complicated machines, as the ship of the sailor, the mill of the fuller, or even the loom of the weaver, let us consider only what a variety of labour is requisite in order to form that very simple machine, the shears, with which the shepherd clips the wool. The miner, the builder of the furnace for smelting the ore, the feller of the timber, the burner of the charcoal to be made use of in the smelting-house, the brick-maker, the bricklayer, the workmen who attend the furnace, the mill-wright, the forger, the smith, must, all of them, join their different arts in order to produce them. Were we to examine in the same manner all the different parts of his dress and household furniture, the course linen shirt which he wears next his skin, the shoes which cover his feet, the bed which he lies on, and all the different parts which compose it, the kitchen grate at which he prepares his victuals, the coals which he makes use of for that purpose, dug from the bowels of the earth, and brought to him, perhaps, by a long sea and a long land-carriage, all the other utensils of his kitchen, all the furniture of his table, the knives and forks, the earthen or pewter plates upon which he serves up and divides his victuals, the different hands employed in preparing his bread and his beer, the glass window which lets in the heat and the light, and keeps out the wind and the rain, with all the knowledge and art requisite for preparing that beautiful and happy invention, without which these northern parts of the world could scarce have afforded a very comfortable habitation, together with the tools of all the different workmen employed in producing these different conveniences :—if we examine, I say, all these things and consider what a variety of labour is employed about each of them, we shall be sensible that without the assistance and co-operation of many thousands, the very meanest person in a civilized country, could not be provided, even according to what we very falsely imagine the easy and simple manner, in which he is commonly accommodated. Compared, indeed, with the more extravagant luxury of the great, his accommodation must, no doubt, appear extremely simple and easy ; and yet it may be true, perhaps, that the accommodation of a European prince does not always so much exceed that of an industrious and frugal peasant, as the accommodation of the latter exceeds that of many an African king, the absolute master of the lives and liberties of ten thousand naked savages.

SMITH.

## LESSON XIII.

### GRADUAL RISE OF MANUFACTURES.

It is pleasing to contemplate a manufacture rising gradually from its first mean state, by the successive labours of innumerable minds; to consider the first hollow trunk of an oak, in which, perhaps the shepherd could scarce venture to cross a brook swelled with a shower, enlarged at last into a ship of war, attacking fortresses, terrifying nations, setting storms and billows at defiance, and visiting the remotest parts of the globe. Who, when he saw the first sand or ashes, by a casual intenseness of heat melted into a metalline form, rugged with excrescences, and clouded with impurities, would have imagined, that in this shapeless lump lay concealed so many conveniences of life, as would, in time constitute a great part of the happiness of the world? Yet, by some such fortuitous liquefaction was mankind taught to procure a body, at once in a high decree, solid and transparent,—which might admit the light of the sun, and exclude the violence of the wind:—which might extend the sight of the philosopher to new ranges of existence; and charm him, at one time, with the unbounded extent of the material creation; aud, at another, with the endless subordination of animal life; and, what is of yet more importance, might supply the decays of nature, and succour old age with subsidiary sight. Thus was the first artificer in glass employed, though without his own knowledge or expectation. He was facilitating and prolonging the enjoyment of light, enlarging the avenues of science, and conferring the highest and most lasting pleasures; he was enabling the student to contemplate nature, and the beauty to behold herself.

JOHNSON.

## LESSON XIV.

### PRINTING.

The art of printing, in all its numerous departments, is essentially an art of copying. Under its two great divisions, viz.:—printing from hollow lines, as in copper-plate, and printing from surface, as in block printing, are comprised numerous arts.

*Copper-plate Printing.*—In this instance the copies are made by transferring to paper, by means of pressure, a thick ink, from the hollows and lines cut in the copper.

*Engraving on Steel.*—This is an art in most respects similar to engraving on copper, except that the number of copies is far less limited. A bank note engraved as a copper plate, will not give above three thousand impressions without a sensible deterioration. Two impressions of a bank-note engraved on steel were examined, and it was found difficult to pronounce; with any confidence, which was the earlier impression. One of these was a proof from among the first thousand, and the other was taken after between seventy and eighty thousand had been printed off.

*Music Printing.*—Music is usually printed from pewter plates, on which the characters have been impressed by steel punches. The metal being much softer than copper is liable to scratches, which detain a small portion of the ink. This is the reason of the dirty appearance of printed music. Sometimes also, it is printed with moveable type; and occasionally the musical characters are printed on the paper, and the lines printed afterwards.

*Calico Printing from Cylinders.*—Many of the patterns on printed calicoes are copies by printing from copper cylinders, about four or five inehes in diameter, on which the desired pattern has been previously engraved. One portion of the cylinder is exposed to the ink, whilst an elastic scraper of stuffed leather, by being pressed forcibly against another part, removes all superfluous ink from the surface previously to its reaching the cloth. A piece of calico twenty-eight yards in length rolls through this press and is printed in four or five minutes.

*Printing from perforated sheets of Metal or Stencilling.*—Very thin brass is sometimes perforated in the form of letters; this is placed on any substance which it is required to mark, and a brush dipped in some paint is passed over the brass. This method, which affords rather a coarse copy, is sometimes used for paper with which rooms are covered, and more especially for the borders.

The beautiful red cotton handkerchiefs dyed at Glasgow have their pattern given to them by a process similar to this, except that instead of *printing* from a pattern the reverse operation—that of *discharging* a part of the colour from a cloth already dyed—is performed. A number of handkerchiefs are pressed with great force between two plates of metal, which are similarly perforated with round or lozenge-shaped holes. The upper plate of metal is surrounded by a rim, and a fluid which has the property of discharging the dye is poured upon that plate. This liquid passes through the holes in the metal, and also through the calico; but owing to the great pressure opposite all the parts of the plates not cut away, it does not spread itself beyond the pattern.

## LESSON XV.

### PRINTING—CONTINUED.

Printing from surface is of more frequent application in the arts than that which has just been described.

*Printing from Wooden Blocks.*—A block of box-wood is, in this instance, the substance out of which the pattern is formed. The design being sketched upon it, the workman cuts away with sharp tools every part except the lines to be represented in the impression. This is exactly the reverse of the process of engraving on copper, in which every line to be represented is cut away. The ink, instead of filling the cavities cut in the wood, is spread upon the surface which remains, and is thence transferred to the paper.

*Printing from Moveable Types.*—This is the most important in its influence of all the arts of copying, It possesses a singular peculiarity, in the immense subdivision of the parts that form the pattern. After that pattern has furnished thousands copies, of the same individual element may be arranged again and again in other forms, and thus supply multitudes of originals, from each of which thousands of their copied impressions may flow.

*Printing from Stereotype.*—This mode of producing copies is very similar to the preceding: but as the original pattern is incapable of change, it is only applied to cases where an extraordinary number of copies are demanded, or where the work consists of figures, and it is of grest importance to insure accuracy.

*Calico Printing from Blocks.*—This is a mode of copying, by surface printing, from the ends of small pieces of copper wire, of various forms, fixed into a block of wood. They are all of one uniform height, about the eighth part of an inch above the surface of the wood, and are arranged by the maker into any required pattern. If the block be placed upon a piece of fine woollen cloth, on which ink of any colour has been uniformly spread, the projecting copper wires receive a portion, which they give up when applied to the calico to be printed, By this plan, after the flower of a rose, for example, has been printed with one set of blocks, the leaves may be printed of another colour by a different set.

*Printing Oil-cloth.*—After the canvas, which forms the basis of oil-cloth, has been covered with paint of one uniform tint, the remainder of the processes which it passes through, are a series of copyings from surface printing, from patterns formed upon wooden blocks very similar to those employed by the calico printer. Each colour requires a distinct set of blocks; and thus those oil-cloths with the greatest variety of colours, are most expensive.

*Lithographic Printing.*—This is another mode of producing copies in almost unlimited number. The original which supplies the copies, is a drawing made on a stone of a slightly porous nature; the ink employed for tracing it, is made of such greasy materials, that when water is poured over the stone it shall not wet the lines of the drawing. When a roller covered with printing ink, which is of an oily nature, is passed over the stone previously wetted, the water prevents this ink from adhering to the uncovered portions; whilst the ink used in the drawing is of such a nature that the printing ink adheres to it. In this state, if a sheet of paper be placed upon the stone, and then passed under a press, the printing ink will be transferred to the paper, leaving the ink used in the drawing still adhering to the stone.

*Register Printing.*—It is sometimes thought necessary to print from a wooden block, or stereotype plate, the same pattern reversed upon the opposite side of the paper. The effect of this, which is technically called *Register Printing*, is to make it appear as if the ink had penetrated through the paper, and rendered the pattern visible on the other side. If the subject chosen contains many fine lines, it seems, at first sight, very difficult to effect so exact a superposition of the two patterns, on opposite sides of the same piece of paper, that it shall be impossible to detect the slightest deviation; yet the process is extremely simple. The block which gives the impression is always accurately brought down to the same place by means of a hinge; this spot is covered by a piece of thin leather stretched over it; the block is now inked, and being brought down to its place gives an impression of the pattern to the leather; it is then turned back, and being inked a second time, the paper intended to be printed is placed upon the leather, when the block again descending the upper surface of the paper is printed from the block, and its under surface takes up the impression from the leather.

BABBAGE.

## LESSON XVI.

### FIRST-RATE MAN-OF-WAR.

Of all the arts and professions which are calculated to attract a particular notice, no one appears more astonishing and marvellous than that of navigation, in the state in which it at present exists. This cannot be made more evident than by taking a retrospective view of the small craft to which navigation owes its origin, and comparing them to a majestic *first-rate man-of-war*, containing one thousand men, with their provisions, drink, furniture, apparel, and other necessaries, for many months, besides one hundred pieces of heavy ordnance, and bearing all this heavy apparatus safely to the most distant shores. A man in health consumes, in the space of twenty-fours hours, about eight pounds of victuals and drink: consequently eight thousand pounds of provisions are daily requisite in such a ship. Let her be supposed then to be fitted out for three months, and it will be found, that she must be laden with 720,000 pounds of provision. A large forty-two pounder, if made of brass, weighs 6,100 pounds, and about

5,500 if of iron; and, in general, there are twenty-eight or thirty of these on the lower gun deck, on board a ship of a hundred guns; the weight of these, exclusive of that of their carriages, amounts to 183,000 pounds. On the middle gun-deck are thirty twenty-four pounders, each weighing about 5,100 pounds, and, therefore, collectively, 153,000 pounds; and the weight of the twenty-six or twenty-eight twelve pounders on the upper gun deck, amounts to about 75,400 pounds; that of the fourteen six-pounders on the quarter-deck, forecastle, and poop, to about 26,000 pounds; and, besides these there are, in the round-tops, three-pounders and swivels. If to this be added, that the complete charge of a forty-two pounder weighs about sixty-four pounds; and that at least one hundred charges are required for each gun, this will be found to amount nearly to the same weight as the guns themselves. In addition also to this, the reflection must be made that every ship must have to provide against exigencies, at least another set of sails, cables, cordage, and tackling, which, taken together, amount to a considerable weight; the stores, likewise, consisting of planks, pitch and tow; the chests belonging to the officers and seamen; the surgeon's stores, and various other articles requisite on a long voyage; with the small arms, bayonets, swords, and pistols. make no inconsiderable load. To this must be finally added, the weight of the crew; so that one of these first-rates carries, at the least, 2,162 tons burthen, or 4,324,000 pounds; and, at the same time, is steered and governed with as much ease as the smallest boat.

CLARKE'S *Wonders.*

## LESSON XVII.

### MISCELLANEOUS EXTRACTS.

The accumulation of skill and science which have been directed to diminish the difficulty of procuring manufactured goods, has not been beneficial to that country alone in which it is concentrated: distant kingdoms have participated in its advantages. The luxurious natives of the East, and the ruder inhabitants of the African desert, are alike indebted to our looms. The produce of our factories has preceded even our most enterprising travellers. The cotton of India is conveyed by British ships round half our planet, to be woven by British skill in the factories of Lancashire: it is again set in motion by British capital, and transported to the very plains whereon it grew, is re-purchased by the lords of the soil which gave it birth, at a cheaper price than that at which their coarser machinery enables them to manufacture it themselves.

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Various operations occur in the arts in which the assistance of an additional hand would be a great convenience to the workmen, and in these cases tools or machines of the simplest structure come to our aid; vices of different forms, in which the material to be wrought is firmly grasped by screws, are of this kind, and are used in almost every workshop; but a more striking example may be found in the trade of the nail-maker.

Some kinds of nails, such as those used for defending the soles of coarse-shoes, called hob-nails, require a particular form of the head, which is made by the stroke of a die; the workman holds the red-hot rod of iron out of which he forms them in his left hand, with his right hand he hammers the end of it into a point, and cutting the proper length almost off, bends it nearly at right angles. He puts this into a hole in a small stake-iron, immediately under a hammer connected with a treadle, which has a die sunk in its surface corresponding to the intended form of the head; and having given one part of the form to the head by the small hammer in his hand, he moves the treadle with his foot, which disengages the other hammer and completes the figure of the head: the returning stroke, produced by the movement of the treadle, striking the finished nail out of the hole in which it was retained. Without this substitution of his foot for another hand, the workman would probably be obliged to heat the nails twice over.

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In the manufacture of scythes, the length of the blade renders it necessary that the workman should move readily, so as to bring every part on the anvil in quick succession; this is effected by placing him in a seat suspended by ropes from the ceiling, so that he is enabled with little bodily exertion, by pressing his feet against the block which supports the anvil, to vary his distance to any required extent. In the manufacture of anchors, an art in which this contrivance is of still greater importance, it has only been recently applied.

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In rivetting together the iron plates out of which steam-engine boilers are made, it is necessary to produce as close a joint as possible; this is accomplished by using the rivets red-hot, while they are in that state the two plates of iron are rivetted together, and the contraction which the rivet undergoes in cooling draws them together with a force which is only limited by the tenacity of the metal of which the rivet itself is made.

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The process of engraving upon gems is one requiring considerable time and skill. The seal thus produced can, therefore, never become common; imitations, however, have been made of various degrees of resemblance. The colour which is given to glass, is perhaps, the most successful part of the imitation. A small cylindrical rod of coloured glass is heated in the flame of a blow-pipe, until the extremity become soft. The operator then pinches it between the ends of a pair of nippers, which are formed of brass, and on one side of which has been carved in relief the device intended for the seal. By this system of copying they are so multiplied that at Birmingham the more ordinary kinds are to be purchased at three pence a dozen.

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Engraving by pressure is one of the most beautiful instances of the art of copying, carried to an almost unlimited extent; and the delicacy with which it can be executed, and the precision with which the finest traces of the graving tool can be transferred from steel to copper, or even from hard steel to soft steel, are most unexpected. An engraving is first made upon soft steel, which is hardened by a peculiar process without in the least injuring its delicacy. A cylinder of soft steel, pressed with great force against the hardened steel engraving, is now made to roll slowly backward and forward over it, thus receiving the design, but in relief. This is in its turn hardened without injury; and if it be rolled slowly to and fro with strong pressure on successive plates of copper, it will imprint on a thousand of them a perfect *fac-simile* of the original steel engraving from which it resulted. Thus the number of copies producible from the same design is multiplied a thousand fold. But even this is very far short of the limits to which this process may be extended. The hardened steel roller bearing the design upon it in relief, may be employed to make a few of its first impressions upon plates of *soft steel*, and these being hardened become the representatives of the original engraving, and may in their turn, be made the parents of other rollers, each generating copper-plates like their prototype.

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The metal to be converted into wire is made of a cylindrical form, and drawn forcibly through circular holes in plates of steel; at each passage it becomes smaller; and when finished, its section at any point is a precise copy of the last hole through which it passed. For many purposes of the arts, wire, the section of which is square, or half round, is required; the same method of making it is pursued, except that the holes through which it is drawn are in such cases themselves square, or half round, or of whatever other form the wire is required to be. A species of wire is made, the section of which resembles a star with from six to twelve rays; this is called pinion wire, and is used by the clock-makers.

BABBAGE.

## LESSON XVIII.

### EMPLOYMENT OF MATERIALS OF LITTLE VALUE.

Among the causes which tend to the cheap production of any article, and which require additional capital, may be mentioned, the care which is taken to allow no part of the raw produce, out of which it is formed, to be absolutely wasted. An attention to this circumstance sometimes causes the union of two trades in one factory, which otherwise would have been separated. An enumeration of the arts to which the horns of cattle are applicable, furnishes a striking example of this kind of economy.

The tanner who has purchased the hides, separates the horns, and sells them to the makers of combs and lanterns. The horn consists of two parts ; an outward horny case, and the inward conical-shaped substance, somewhat between hardened hair and bone. The first process consists of separating these two parts, by means of a blow against a block of wood. The horny outside is then cut into three portions.

The lowest of these, next the root of the horn, after being rendered flat, is made into combs.

The middle of the horn, after being flattened by heat, and its transparency improved by oil, is split into thin layers, and forms a substitute for glass in lanterns of the commonest kinds.

The tip of the horn is used by the makers of knife handles, and for the tops of whips, and similar purposes.

The interior or cone of the horn is boiled down in water.

A large quantity of fat rises to the surface; this is put aside, and sold to the makers of yellow soap.

The liquid itself is used as a kind of glue, and is purchased by the cloth dressers for stiffening.

The bony substance which remains behind is ground down and sold to the farmers for manure.

The shavings, which form the refuse of the lantern-maker, are cut into various figures, and painted, and used as toys, which curl up when placed on the palm of a warm hand.

The skins used by the gold-beater are produced from the offal of animals. The hoofs of horses and cattle, and other horny refuse, are employed in the production of the prussiate of potash, that beautiful yellow crystalized salt, which is exhibited in the shops of some of our chemists.

The worn-out saucepans and tin ware of our kitchens, when beyond the reach of the tinker's art are not utterly worthless. We sometimes meet carts loaded with old tin kettles, and worn-out iron coal-scuttles, traversing our streets. These have not yet completed their useful course: the less corroded parts are cut into strips, punched with small holes, and varnished with a coarse black varnish, for the use of the trunk-maker, who protects the edges and angles of his boxes with them; the remainder are conveyed to the manufacturing chemists, in the outskirts of the town, who employ them, in conjunction with pyroligneous acid, in making a black dye for the use of calico printers.

*Economy of Manufactures*—BABBAGE.

# SECTION V

## LESSON I.

### COMPLAINT OF THE DYING YEAR.

"I am," said he, "the son of old father *Time*, and the "last of a numerous progeny; for he has had no less than "several thousands of us; but it has ever been his fate to "see one child expire before another was born. It is the "opinion of some that his own constitution is beginning to "break up, and that when he has given birth to a hundred or two, more of us, his family will be complete, and "then he himself will be no more."

Here the Old Year called for his account-book, and turned over the pages with a sorrowful eye. He has kept, it appears, an accurate account of the moments, minutes, hours, and months, which he has issued, and subjoined in some places memorandums of the uses to which they have been applied, and of the loss he has sustained. These particulars it would be tedious to detail, but we must notice one circumstance; upon turning to a certain page in his accounts, the old man was much affected, and the tears streamed down his furrowed cheeks as he examined it. This was the register of the fifty-two Sundays which he had issued; and which, of all the wealth he had to dispose of, has been, it appears, the most scandalously wasted. "These," said he, "were my most precious gifts. I "feel, however," said he, "more pity than indignation "towards these offenders, since they were far greater ene-

" mies to themselves than to me. But there are a few " outrageous ones, by whom I have been defrauded of so " much of my substance, that it is difficult to think of them " with patience, particularly that notorious *thief*, *Procrastination*, of whom every body has heard, and who is " well known to have wronged my venerable father of so " much of his property. There are also three noted ruffians, *Sleep*, *Sloth*, and *Pleasure*, from whom I have " suffered much ; besides a certain busybody called *Dress*, " who, under the pretence of making the most of me, and " taking great care of me, steals away more of my gifts " than any two of them.

" As for me, all must acknowledge that I have performed my part towards my friends and foes. I have " fulfilled my utmost promise, and been more bountiful " than many of my predecessors. My twelve fair children " have, each in their turn, aided my exertions ; and their " various tastes and dispositions have all conduced to the " general good. Mild *February*, who sprinkled the naked " boughs with delicate buds, and brought her wonted offering of early flowers, was not of more essential service " than that rude, blustering boy *March*, who, though " violent in his temper, was well-intentioned and useful. " *April*, a gentle tender-hearted girl, wept for his loss, " yet cheered me with many a smile. *June* came, " crowned with roses, and sparkling in sunbeams, and " laid up a store of costly ornaments for her luxuriant successors. But I cannot stop to enumerate the good qualities and graces of all my children. You, my poor *December*, dark in your complexion, and cold in your temper, greatly resemble my first-born, *January*, with this

" difference, that he was most prone to anticipation, and " you to reflection.

" It is very likely that, at least after my decease, many " may reflect upon themselves for their misconduct towards me. To such I would leave it as my dying injunction not to waste time in unavailing regret; all their " wishes and repentance will not recall me to life. I shall " never, never return! I would rather earnestly recommend to their regard my youthful successor, whose appearance is shortly expected. I cannot hope to live " long enough to introduce him; but I would fain hope " that he would meet with a favourable reception; and " that in addition to the flattering honours which greeted " my birth, and the fair promises which deceived my " hopes, more diligent exertion, and more persevering efforts may be expected. Let it be remembered that one " honest endeavour is worth ten fair promises."

HENDERSON.

## LESSON II.

### WHAT IS TIME?

I ask'd an aged man, a man of cares,
Wrinkled and curved, and white with hoary hairs;
" Time is the warp of life," he said; " Oh tell
The young, the fair, the gay, to weave it well!"
I ask'd the ancient, venerable dead,
Sages who wrote, and warriors who bled;
From the cold grave a hollow murmur flow'd,
" Time sow'd the seed we reap in this abode!"
I ask'd a dying sinner, ere the tide

Of life had left his veins.—"Time," he replied,
"I've lost it! Ah, the treasure!" and he died.
I ask'd the golden sun and silver spheres,
Those bright chronometers of days and years:
They answered, "Time is but a meteor glare,"
And bade us for eternity prepare.
I ask'd the Seasons in their annual round,
Which beautify or desolate the ground;
And they replied, (no oracle more wise),
"'Tis Folly's blank, and Wisdom's highest prize!
I ask'd a spirit lost, but oh! the shriek
That pierced my soul! I shudder while I speak!
It cried, "A particle! a speck! a mite
Of endless years, duration infinite!"
Of things inanimate, my dial I
Consulted, and it made me this reply—
"Time is the season fair of living well,
The path of glory or the path of hell."
I ask'd my Bible, and methinks it said,
"Time is the present hour, the past is fled;
Live! live to-day! to-morrow never yet
On any human being rose or set."
I ask'd old Father Time himself at last;
But in a moment he flew swiftly past!
His chariot was a cloud, the viewless wind
His noiseless steeds, which left no trace behind.
I ask'd the mighty Angel, who shall stand
One foot on sea, and one on solid land;
"By Heaven!" he cried, "I swear the mystery's o'er
"Time was," he cried, "but Time shall be no more!"

MARSDEN.

## LESSON III.

### WESTMINSTER ABBEY.

When I am in a serious humour, I very often walk by myself in Westminster Abbey, where the gloominess of the place and the use to which it is applied, with the solemnity of the building and the condition of the people who lie in it, are apt to fill the mind with a melancholy, or rather thoughtfulness, that is not disagreeable. I, yesterday passed the whole afternoon in the churchyard, the cloisters, and the church, amusing myself with the tombstones and inscriptions that I met with in those several regions of the dead. Most of them recorded no more of the buried person, but that he was born upon one day, and died upon another; the whole history of his life being comprehended in those two circumstances that are common to all mankind. I could not but look upon these registers of existence, whether of brass or marble, as a kind of satire upon the departed persons, who had left no other memorial of them, but that they were born, and that they died.

Upon my going into the church, I entertained myself with the digging of a grave, and saw in every shovel-ful of it that was thrown up the fragment of a bone or skull, intermixed with a kind of fresh mouldering earth, that some time or other had a place in the composition of a human body. Upon this I began to consider with myself what innumerable multitudes of people lay concealed together under the pavement of that ancient cathedral; how men and women, friends and enemies, priests and soldiers, monks and prebendaries, were crumbled amongst one another and blended together in one common mass; how beauty, strength, and youth, with old age, weakness, and deformity, lay undistinguished in the same promiscuous heap of matter.

After having surveyed this great magazine of mortality as it were in the lump, I examined it more particularly, by the account which I found on several of the monuments which are raised in every quarter of that ancient fabric. Some of them were covered with such extravagant epitaphs that if it were possible for the dead person to be acquainted with them, he would blush at the praises which his friends had bestowed upon him. There are others so excessively modest, that they deliver the character of the person departed in Greek or Hebrew, and by that means are not understood once in a twelvemonth. In the poetical quarter I found there were poets who had no monuments, and monuments which had no poets. I observed, indeed, that the present war had filled the church with many of those uninhabited monuments, which had been erected to the memory of persons whose bodies were perhaps, buried in the plains of Blenheim, or in the bosom of the ocean.

I know that entertainments of this nature are apt to raise dark and dismal thoughts in timorous minds and gloomy imaginations; but, for my own part, though I am always serious, I do not know what it is to be melancholy; and can, therefore, take a view of Nature in her deep and solemn scenes with the same pleasure as in her most gay and delightful ones. By this means I can improve myself with those objects which others consider with terror.

When I look upon the tombs of the great, every emotion of envy dies in me; when I read the epitaphs of the beautiful, every inordinate desire goes out; when I meet with the grief of parents upon a tombstone, my heart melts with compassion; when I see the tomb of the parents themselves, I consider the vanity of grieving for those whom we must quickly follow; when I see kings lying by those who deposed them; when I consider rival wits placed side by side, or the writers on religion, that divided the world with their contests and disputes, I reflect, with sorrow and astonishment, on the little competitions, factions, and debates of mankind. When I read the several dates of the tombs, of some that died yesterday, and some six hundred years ago, I consider that great day when we shall all of us be contemporaries, and make our appearance together. *Spectator.*

## LESSON IV.

### OCEAN.

Roll on, thou deep and dark blue ocean—roll!
Ten thousand fleets sweep over thee in vain;
Man marks the earth with ruin—his control
Stops with the shore; upon the watery plain
The wrecks are all thy deed, nor doth remain
A shadow of man's ravage, save his own;
When for a moment, like a drop of rain,
He sinks into thy deeps with bubbling groan,
Without a grave, unknell'd, uncoffin'd, and unknown.

His steps are not upon thy paths,—thy fields
Are not a spoil for him,—thou dost arise
And shake him from thee; the vile strength he wields
For earth's destruction, thou dost all despise,
Spurning him from thy bosom to the skies,
And send'st him, shivering, in thy playful spray,
And howling to his gods, where haply lies
His petty hope in some near port or bay,
And dashest him again to earth: there let him lay.

The armaments which thunderstrike the walls
Of rock-built cities, bidding nations quake,
And monarchs tremble in their capitals,—
The oak leviathans, whose huge ribs make
Their clay creator the vain title take
Of lord of thee, and arbiter of war;
These are thy toys, and as the snowy flake,
They melt into thy yeast of waves, which mar,
Alike the Armada's pride or spoils of Trafalgar.

Thy shores are empires, changed in all save thee—
Assyria, Greece, Rome, Carthage, where are they?
Thy waters wasted them while they were free,
And many a tyrant since; their shores obey
The stranger, slave, or savage; their decay
Has dried up realms to deserts;—not to thou,
Unchangeable save to thy wild waves' play—
Time writes no wrinkle on thine azure brow—
Such as creation's dawn beheld, thou rollest now.

Thou glorious mirror, where the Almighty's form
Glasses itself in tempests; in all time,
Calm or convuls'd—in breeze, or gale, or storm,
Iceing the pole, or in the torrid clime
Dark-heaving: boundless, endless, and sublime—
The image of eternity—the throne
Of the Invisible; even from out thy slime
The monsters of the deep are made: each zone
Obeys thee; thou goest forth, dread, fathomless, alone.

And I have loved the ocean! and my joy
Of youthful sport was on thy breast to be
Borne, like thy bubbles, onward: from a boy
I wanton'd with thy breakers—they to me
Were a delight; and if the freshening sea
Made them a terror—'twas a pleasing fear,
For I was as it were a child of thee,
And trusted to thy billows far and near,
And laid my hand upon thy mane—as I do here.

BYRON.

## LESSON V.

### MR. PITT'S REPLY TO HORACE WALPOLE.

SIR,—The atrocious crime of being a young man, which the honourable gentleman has with such spirit and decency charged upon me, I shall neither attempt to palliate nor deny; but content myself by wishing that I may be one of those whose follies may cease with their youth, and not of those who continue ignorant in spite of age and experience.

Whether youth can be attributed to any man as a reproach, I will not, Sir, assume the province of determining, but surely age may justly become contemptible if the opportunities which it brings have passed away without improvement, and vice appears to prevail when the passions have subsided. The wretch who, after having seen the consequences of a thousand errors, continues still to blunder, and in whom age has only added obstinacy to stupidity, is surely the object either of abhorrence or contempt, and deserves not that his grey head should secure him from insults. Much more, Sir, is he to be abhorred, who, as he has advanced in age, has receded from virtue and become more wicked with less temptation; who prostitutes himself for money which he cannot enjoy, and spends the remains of his life in the ruin of his country.

But youth, Sir, is not my only crime: I have been accused of acting a theatrical part. A theatrical part may either imply some peculiarities of gesture, or a dissimulation of my real sentiments, and the adoption of the opinions and language of another man.

In the first sense, Sir, the charge is too trifling to be confuted, and deserves to be mentioned only that it may be despised. I am at liberty, like every other man, to use my own language; and though I may, perhaps, have some ambition to please this gentleman, I shall not lay myself under any restraint, nor very solicitously copy his diction or his mien, however matured by age or modelled by experience.

But if any man shall, by charging me with theatrical behaviour, imply that I utter any sentiments but my own, I shall treat him as a calumniator and a villain; nor shall any protection shelter him from the treatment he deserves. I shall, on such an occasion, without scruple, trample upon all those forms with which wealth and dignity entrench themselves; nor shall any thing but age restrain my resentment—age, which always brings with it one privilege, that of being insolent and supercilious without punishment.

But with regard, Sir, to those whom I have offended, I am of opinion, that if I had acted a borrowed part, I should have avoided their censure. The heat which offended them, is the ardour of conviction, and that zeal for the service of my country which neither hope nor fear shall influence me to suppress. I will not sit unconcerned while my liberty is invaded, nor look in silence upon public robbery. I will exert my endeavours, at whatever hazard, to repel the aggressor, and drag the thief to justice, whoever may protect him in his villainy, and whoever may partake of his plunder.

## LESSON VI.

### DETACHED PIECES.

The bell strikes one. We take no note of time
But from its loss: to give it then a tongue
Is wise in man. As if an angel spoke,
I feel the solemn sound. If heard aright,
It is the knell of my departed hours.
Where are they? With the years beyond the flood.
It is the signal that demands despatch:

How much is to be done! My hopes and fears
Start up alarm'd, and o'er life's narrow verge
Look down—on what? A fathomless abyss!
A dread eternity! How surely mine!
And can eternity belong to me,
Poor pensioner on the bounties of an hour?

What does not fade? The tower that long hath stood
The crash of thunder, and the warring winds,
Shook by the slow, but, sure destroyer, time,
Now hangs in doubtful ruin o'er its base;
And flinty pyramids, and walls of brass,
Descend: the Babylonian spires are sunk:
Achaia, Rome, and Egypt moulder down;
Time shakes the stable tyranny of thrones,
And tottering empires crush by their own weight.
This huge rotundity we tread grows old:
And all those worlds that roll around the sun,—
The sun himself—shall die; and ancient night
Again involve the desolate abyss:
Till the great Father, through the lifeless gloom,
Extend his arm to light another world,
And bid new planets roll by other laws.

ARMSTRONG.

Yon cottager, who weaves at her own door,
Pillow and bobbins, all her little store ;
Content, though mean, and cheerful, if not gay,
Shuffling her threads about the livelong day,
Just earns a scanty pittance, and at night
Lies down secure, her heart and pocket light.
She, for her humble sphere by nature fit,
Has little understanding, and no wit,
Receives no praise ; but though her lot be such
(Toilsome and indigent) she renders much ;
Just knows, and knows no more, her Bible true—
A truth the brilliant Frenchman* never knew ;
And in that charter reads with sparkling eyes
Her title to a treasure in the skies.
  Oh happy peasant ! oh unhappy bard !
His the mere tinsel, hers the rich reward ;
He praised perhaps for ages yet to come,
She never heard of half a mile from home :
He, lost in errors, his vain heart prefers,
She, safe in the simplicity of hers.

COWPER.

True Happiness hath no localities,
No tones provincial, no peculiar garb.
Where duty goes, she goes ; with justice goes ;
And goes with meekness, charity and love,
Where'er a tear is dried ; a wounded heart
Bound up, a bruised spirit with the dew
Of sympathy anointed ; or a pang

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*Voltaire.

Of honest suffering soothed; or injury
Repeated oft, as oft by love forgiven.
Where'er an evil passion is subdued,
Or virtue's feeble embers found; where'er
A sin is heartily abjured and left—
There is a high and holy place, a spot
Of sacred light, a most religious fane,
Where happiness descending, sits and smiles.

POLLOCK.

Oh how unlike the complex works of man,
Heaven's easy, artless, unencumber'd plan!
No meretricious graces to beguile,
No clustering ornaments to clog the pile:
From ostentation, as from weakness, free,
It stands like the cerulean arch we see,
Majestic in its own simplicity.
Inscribed above the portal from afar,
Conspicuous as the brightness of a star,
Legible only by the light they give,
Stand the soul quickening words—BELIEVE AND LIVE

COWPER.

A cloud lay cradled near the setting sun,
  A gleam of crimson tinged its braided snow,
Long had I watch'd the glory moving on
  O'er the still radiance of the lake below.
Tranquil its spirit seem'd, and floated slow!
  Even in its very motion there was rest;
While every breath of eve that chanced to blow,
  Wafted the travel'er to the beauteous west.

Emblem, methought, of the departed soul!
  To whose white robe the gleam of bliss is given:
And by the breath of mercy made to roll
  Right onward to the golden gates of heaven,
Where to the eye of Faith it peaceful lies,
And tells to man his glorious destinies.

WILSON.

## LESSON VII.

### WAR.

The first great obstacle to the extinction of war is, the way in which the heart of man is carried off from its barbarities and its horrors by the splendour of its deceitful accomplishments. There is a feeling of the sublime in contemplating the shock of armies, just as there is in contemplating the devouring energy of a tempest; and this so elevates and engrosses the whole man, that his eye is blind to the tears of bereaved parents, and his ear is deaf to the piteous moan of the dying and the shriek of their desolated families. There is a gracefulness in the picture of a youthful warrior burning for distinction in the field, and lured by this generous aspiration to the deepest of the animated throng, where in the fell work of death, the opposing sons of valour struggle for a remembrance and a name:—and this side of the picture is so much the excessive object of our regard, as to disguise from our view the mangled carcasses of the fallen, and the writhing agonies of the hundreds more who have been laid on the cold ground, where they are left to languish and to die. There no eye pities them. No sister is there to weep over them. There no gentle hand is present to ease the dying posture, or bind up the wounds, which, in the maddening fury of the combat, have been given and received by the children of one common Father.

On every side of me I see causes at work which go to spread a most delusive colouring over war, and to remove its shocking barbarities to the back ground of our contemplations altogether. I see it in the history which tells me of the superb appearance of the troops and the brilliancy of their successive charges—I see it in the poetry which lends the magic of its numbers to the narrative of blood, and transports its many admirers, as by its images and its figures, and its nodding plumes of chivalry, it throws its treacherous embellishments over a scene of legalized slaughter. All, all ages go to prove what strange and half-sighted creatures we are. Were it not so, war could never have been seen in any other aspect than that of unmingled hatefulness: and I can look at nothing but to the progress of Christian sentiment upon earth to arrest the strong current of its popular and prevailing partiality for war. Then will glory be reduced to its right estimate—and the wakeful benevolence of the gospel, chasing away every spell, will be turned by no treachery of delusion whatever from its simple but sublime enterprises for the good of the species. Then the reign of truth and quietness will be ushered into the world, and war, cruel, atrocious, unrelenting war, will be stripped of many of its bewildering fascinations.

CHALMERS.

The swain, in barren desert, with surprise
Sees lilies spring and sudden verdure rise;
And starts amidst the thirsty wilds to hear
New falls of water murmuring in his ear.
On rifted rocks, the dragons' late abodes,
The green reed trembles and the bulrush nods,
Waste sandy valleys, once perplexed with thorns,
The spiry fir and shapely box adorn;
To leafless shrubs and flowery palms succeed,
An odorous myrtle to the noisome weed.
The lambs with wolves shall graze the verdant mead,
And boys in flowery bands the tiger lead;
The steer and lion at one crib shall meet,
And harmless serpents lick the pilgrim's feet.
The smiling infant in his hand shall take
The crested basilisk and speckled snake.
Pleased, the green lustre of the scales survey,
And with their forky tongues shall innocently play.

POPE.

## LESSON VIII.

### ON INFIDELITY

It is amidst trials and sorrows that infidelity appears in its justest and most frightful aspect. When subject to the multifarious ills which flesh is heir to, what is there to uphold our spirit, but the discoveries and the prospects that are unfolded to us by revelation? What, for this purpose, can be compared with the belief that every thing here below is under the management of infinite wisdom and goodness, and that there is an immortality of bliss awaiting us in another world? If this conviction be taken away, what is it that we can have recourse to, on which the mind may patiently and safely repose in the season of adversity? Where is the balm which I may apply with effect to my wounded heart, after I have rejected the aid of the Almighty Physician? Impose upon me whatever hardship you please, give me nothing but the bread of sorrow to eat; take from me the friends in whom I had placed my confidence; lay me in the cold hut of poverty, and on the thorny bed of disease; set death before me in all its terrors; do all this,—only let me trust in my Saviour, and "pillow my head on the bosom of Omnipotence," and I will "fear no evil,"—I will rise superior to affliction,—I will "rejoice in my tribulation." But, let infidelity interpose between God and my soul, and draw its impenetrable veil over a future state of existence, and limit all my trust to the creatures of a day, and all my expectations to a few years as uncertain as they are short, and how shall I bear up, with fortitude or with cheerfulness, under the burden of distress? Or where shall I find one drop of consolation to put into the bitter draught which has been given me to drink? I look all over the range of this wilderness in which I dwell, but I see not one covert from the storm, nor one leaf for the healing of my soul, nor one cup of cold water to refresh me in the weariness and the faintings of my pilgrimage.

THOMPSON.

## PROVIDENCE.

God moves in a mysterious way,
His wonders to perform;
He plants his footsteps in the sea,
And rides upon the storm.

Deep in unfathomable mines
Of never failing skill,
He treasures up his bright designs
And works his sovereign will.

Ye fearful saints, fresh courage take,
The clouds ye so much dread
Are big with mercy, and shall break
In blessings on your head.

Judge not the Lord by feeble sense,
But trust him for his grace;
Behind a frowning Providence
He hides a smiling face.

His purposes will ripen fast,
Unfolding every hour;
The bud may have a bitter taste,
But sweet will be the flower.

Blind unbelief is sure to err,
And scan his work in vain:
God is his own interpreter,
And he will make it plain.

Cowper

# LESSON IX.

## INSIGNIFICANCE OF THIS WORLD.

Though the earth were to be burned up, though the trumpet of its desolation were sounded, though yon sky were to pass away as a scroll, and every visible glory which the finger of the Divinity has inscribed on it were extinguished for ever—an event so awful to us and to every world in our vicinity, by which so many suns would be extinguished, and so many varied scenes of life and population would rush into forgetfulness—what is it in the high scale of the Almighty's workmanship? A mere shred, which, though scattered into nothing, would leave the universe of God one entire scene of greatness and majesty. Though the earth and the heavens were to disappear, there are other worlds which roll afar; the light of other suns shines upon them; and the sky which mantles them, is garnished with other stars. Is it presumption to say, that the moral world extends to these distant and unknown regions? that they are occupied with people? that the charities of home and of neighbourhood flourish there? that the praises of God are there lifted up, and his goodness rejoiced in? that there piety has its temples and its offerings? and the richness of the Divine attributes is there felt and admired by intelligent worshippers?

And what is this world in the immensity which teems with them; and what are they who occupy it? The universe at large would suffer as little in its splendour and variety by the destruction of our planet, as the verdure and sublime magnitude of a forest would suffer by the fall of a single leaf. The leaf quivers on the branch which supports it. It lies at the mercy of the slightest accident. A breath of wind tears it from its stem, and it lights on the stream of water which passes underneath. In a moment of time, the life, which we know by the microscope, it teems with, is extinguished; and an occurrence so insignificant in the eye of man, and in the scale of his observation, carries in it, to the myriads which people this little leaf, an event as terrible and as decisive as the destruction of a world. Now, on the grand scale of the universe, we, the occupiers of this ball, which performs its little round among the suns and the systems which astronomy has unfolded—we may feel the same littleness and the same insecurity. We differ from the leaf only in this circumstance, that it would require the operation of greater elements to destroy us. But these elements exist. The fire which rages within, may lift its devouring energy to the surface of our planet, and transform it into one wide and wasting volcano. The sudden formation of elastic matter in the bowels of the earth—and it lies within the agency of known substances to accomplish this—may explode it into fragments. The exhalation of noxious air from below, may impart a virulence to the air that is around us; it may affect the delicate portion of its ingredients; and the whole of animated nature may wither and die under the malignity of a tainted atmosphere. A blazing comet may cross this fated planet in its orbit, and realize all the terrors which superstition has conceived of it. We cannot anticipate with precision the consequences of an event which every astronomer must know to lie within the limits of chance and probability. It may hurry our globe towards the sun—or drag it to the outer regions of the planetary system—or give it a new axis of revolution—and the effect, which I shall simply announce, without explaining it, would be to change the place of the ocean, and bring another mighty flood upon our islands and continents.

These are accidents which may happen in a single instant of time, and against which nothing known in the present system of things provides us with any security. They might not annihilate the earth, but they would unpeople it; and we, who tread its surface with such firm and assured footsteps, are at the mercy of devouring elements, which, if let loose upon us by the hand of the Almighty, would spread solitude, and silence, and death over the dominions of the world.

Now, it is this littleness, and this insecurity, which make the protection of the Almighty so dear to us, and brings with such emphasis to every pious bosom the holy lessons of humility and gratitude. The God who sitteth above, and presides in high authority over all worlds, is mindful of man; and though at this moment energy is felt in the remotest provinces of creation, we may feel the same security in His providence, as if we were the objects of His undivided care.

It is not for us to bring our minds up to this mysterious agency. But such is the incomprehensible fact, that the same Being, whose eye is abroad over the whole universe, gives vegetation to every blade of grass, and motion to every particle of blood which circulates through the veins of the minutest animal: that though His mind takes into its comprehensive grasp immensity and all its wonders, I am as much known to Him as if I were the single object of His attention; that He marks all my thoughts; and He gives birth to every feeling and every movement within me; and that, with an exercise of power which I can neither describe nor comprehend, the same God who sits in the highest heaven, and reigns over the glories of the firmament, is at my right hand to give me every breath which I draw, and every comfort which I enjoy.

CHALMERS.

## LESSON X.

### THE DAY OF REST.

How still the morning of the hallow'd day!—
Mute is the voice of rural labour, hush'd
The ploughboy's whistle and the milk-maid's song.
The scythe lies glittering in the dewy wreath
Of tedded grass, mingled with faded flowers
That yester-morn bloom'd waving in the breeze.
Sounds the most faint attract the ear;—the hum
Of early bee, the trickling of the dew,
The distant bleating midway up the hill.
Calmness sits throned on yon unmoving cloud.
To him, who wanders o'er the upland lea,
The blackbird's note comes mellower from the dale,
And sweeter from the sky the gladsome lark
Warbles his heaven-tuned song; the lulling brook
Murmurs more gently down the deep-worn glen;
While from yon lowly roof, whose curling smoke

O'ermounts the mist, is heard at intervals
The voice of psalms, the simple song of praise.

With dove-like wings peace o'er yon village broods :
The dizzing mill-wheel rests ; the anvil's din
Hath ceased ; all, all around is quietness.
Less fearful on this day, the limping hare
Stops, and looks back, and stops and looks on man,
Her deadliest foe. The toil-worn horse, set free,
Unheedful of the pleasure, roams at large ;
And as his stiff unwieldy bulk he rolls,
His iron armed hoofs gleam in the morning ray.

But chiefly man the day of rest enjoys ;
Hail, Sabbath ! thee I hail, the poor man's day,
On other days the man of toil is doom'd
To eat his joyless bread, lonely ; the ground
Both seat and board ; screen'd from the winter's cold,
And summer's heat, by neighbouring hedge or tree ;
But on this day, embosom'd in his home,
He shares the frugal meal with those he loves ;
With those he loves he shares the heartfelt joy
Of giving thanks to God—not thanks of form,
A word and a grimace, but reverentially,
With cover'd face, and upward, earnest eye.

Hail, Sabbath ! thee I hail, the poor man's day,
The pale mechanic now has leave to breathe
The morning air, pure from the city's smoke ;
While wandering slowly up the river side,
He meditates on Him, whose power he marks

In each green tree that proudly spreads the bough,
As in the tiny dew-bent flowers that bloom
Around its root; and while he thus surveys,
With elevated joy, each rural charm,
He hopes, yet fears presumption in the hope,
That Heaven may be one Sabbath without end.

GRAHAM.

## LESSON XI.

### DETACHED PIECES.

No ceremony that to great ones 'longs,
Not the king's crown, nor the deputed sword,
The marshal's truncheon, nor the judge's robe,
Becomes them with one half so good a grace
As mercy does.

Why, all the souls that were, were forfeit once,
And one, that might the 'vantage best have took,
Found out the remedy. How should you be,
If He, which is the top of judgment, should
But judge you as you are? Oh! think on that
And mercy then will breathe within your lips
Like man new made.

The quality of mercy is not strained;
It droppeth as the gentle rain from heaven
Upon the place beneath: it is twice blessed;
It blesseth him that gives, and him that takes;
'Tis mightiest in the mightiest; it becomes

The throned monarch better than his crown;
His sceptre shows the force of temporal power,
The attribute to awe and majesty,
Wherein doth sit the dread and fear of kings;
But mercy is above this sceptred sway,
It is enthroned in the fear of kings,
It is an attribute to God himself;
And earthly power doth then show likest God's,
When mercy seasons justice. Think of this,
That in the course of justice none of us
Should see salvation. We do pray for mercy;
And that same prayer doth teach us all to render
The deeds of mercy.

The cloud-capp'd towers, the gorgeous palaces,
The solemn temples, the great globe itself,
Yea, all that it inherits, shall dissolve,
And like the baseless fabric of a vision,
Leave not a wreck behind.

Canst thou minister to a mind diseased,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And, with some sweet oblivious antidote,
Cleanse the foul bosom of that perilous stuff
Which weighs upon the heart?

'Tis the mind that makes the body rich;
And as the sun breaks through the darkest clouds
So honour peereth in the meanest habit.
What! is the jay more precious than the lark,

Because his feathers are more beautiful ?
Or is the adder better than the eel,
Because his painted skin contents the eye ?

How sweet the moonlight sleeps upon this bank !
Here will we sit, and let the sounds of music
Creep in our ears ; soft stillness, and the night,
Become the touches of sweet harmony.

## LESSON XII.

### THE VISION OF MIRZA, EXHIBITING A PICTURE OF HUMAN LIFE.

On the fifth day of the moon, which, according to the custom of my forefathers, I always keep holy, after having washed myself, and offered up my morning devotions, I ascended the high hills of Bagdad, in order to pass the rest of the day in meditation and prayer. As I was here airing myself on the tops of the mountains, I fell into a profound contemplation on the vanity of human life ; and passing from one thought to another, Surely, said I, man is but a shadow, and life a dream. Whilst I was thus musing, I cast my eyes towards the summit of a rock, that was not far from me, where I discovered one in the habit of a shepherd, with a little musical instrument in his hand. As I looked upon him, he applied it to his lips, and began to play upon it. The sound of it was exceeding sweet, and wrought into a variety of tunes that were inexpressibly melodious, and altogether different from anything I had ever heard: they put me in mind of those heavenly airs that are played to the departed souls of good men upon their first arrival in paradise, to wear out the impressions of the last agonies, and qualify them for the pleasures of that happy place. My heart melted away in secret raptures.

I had been often told, that the rock before me was the haunt of a genius; and that several had been entertained with that music, who had passed by it, but never heard that the musician had before made himself visible. When he had raised my thoughts by those transporting airs which he played, to taste the pleasures of his conversation, as I looked upon him like one astonished, he beckoned to me, and by the waving of his hand, directed me to approach to the place where he sat. I drew near with that reverence which is due to a superior nature; and as my heart was entirely subdued by the captivating strains I had heard, I fell down at his feet and wept. The genius smiled upon me with a look of compassion and affability that familiarized him to my imagination, and at once dispelled all the fears and apprehensions with which I approached him. He lifted me from the ground, and taking me by the hand, Mirza, said he, I have heard thee in thy soliloquies; follow me.

He then led me to the highest pinnacle of the rock, and placing me on the top of it, Cast thy eyes eastward, said he, and tell me what thou seest?—I see, said I, a huge valley, and a prodigious tide of water rolling through it. The valley that thou seest, said he, is the valley of Misery; and the tide of water that thou seest is part of the great tide of Eternity. What is the reason, said I, that the tide I see rises out of a thick mist at one end, and again loses itself in a thick mist at the other? What thou seest, said he, is that portion of eternity which is called Time, measured out by the sun, and reaching from the beginning of the world to its consummation. Examine now, said he, this sea that is bounded with darkness at both ends, and tell me what thou discoverest in it. I see a bridge, said I, standing in the midst of the tide. The bridge thou seest, said he, is human life; consider it attentively. Upon a more leisurely survey of it, I found that it consisted of three score and ten entire arches, with several broken arches, which added to those that were entire, made up the number about an hundred. As I was counting the arches, the genius told me that this bridge first consisted of a thousand arches; but that a great flood swept away the rest, and left the bridge in the ruinous conditon I now beheld it: but tell me further, said he, what thou discoverest on it. I see multitudes of people passing over it, said I, and a black cloud hanging on each end of it. As I looked more attentively, I saw several of the passengers dropping through the bridge into the great tide that flowed underneath it; and, upon further examination, perceived there were innumerable trap-doors that lay concealed in the bridge, which the passengers no sooner trod upon, but they fell through them into the tide, and immediately disappeared. These hidden pit-falls were set very thick at the entrance of the bridge, so that throngs of people no sooner broke through the cloud, but many of them fell into them. They grew thinner towards the middle, but multiplied and lay closer together towards the end of the arches that were entire. There were, indeed, some persons, but their number was very small, that continued a kind of hobbling march on the broken arches, but fell through, one after another, being quite tired and spent with so long a walk.

I passed some time in the contemplation of this wonderful structure, and the great variety of objects which it presented. My heart was filled with a deep melancholy, to see several dropping unexpectedly in the midst of mirth and jollity, and catching at every thing that stood by them to save themselves ; some were looking up towards the heavens in a thoughtful posture, and, in the midst of a speculation, stumbled and fell out of sight ; multitudes were busy in the pursuit of bubbles, that glittered in their eyes and danced before them, but often when they thought themselves within the reach of them, their footing failed, and down they sunk. In this confusion of objects I observed some with scimitars in their hands, and others with phials, who ran to and fro upon the bridge, thrusting several persons on trap doors which did not seem to lie in their way, and which they might have escaped had they not been thus forced upon them.

The genius seeing me indulge myself in this melancholy prospect, told me I had dwelt long enough upon it. Take thine eyes off the bridge, said he, and tell me if thou seest anything that thou dost not comprehend. Upon looking up, What mean, said I, those great flocks of birds that are perpetually hovering about the bridge, and settling upon it from time to time? I see vultures, harpies, ravens, cormorants, and, among many other feathered creatures, several little winged boys, that perch in great numbers upon the middle arches. These, said the genius, are *Envy*, Avarice, Superstition, Despair, Love, with the like cares and passions that infest human life. I here fetched a deep sigh: Alas, said I, man was made in vain! how is he given away to misery and mortality, tortured in life, and swallowed up in death! The genius being moved with compassion towards me, bid me quit so uncomfortable a prospect. Look no more, said he, on man in the first stage of his existence, in his setting out for eternity, but cast thine eye on that thick mist into which the tide bears the several generations of mortals that fall into it. I directed my sight as I was ordered, and (whether or no the good genius strengthened it with any supernatural force, or dissipated part of the mist, that was before too thick for the eye to penetrate) I saw the valley opening at the further end, and spreading into an immense ocean, that had a huge rock of adamant running through the midst of it, and dividing it into two equal parts. The clouds still rested on one half of it, insomuch that I could discover nothing in it; but the other appeared to me a vast ocean, planted with innumerable islands that were covered with fruits and flowers, and interwoven with a thousand little shining seas that ran among them; I could see persons dressed in glorious habits, with garlands upon their heads, passing among the trees, lying down by the side of fountains, or resting on beds of flowers, and could hear a confused harmony of singing birds, falling waters, human voices, and musical instruments. Gladness grew in me at the discovery of so delightful a scene. I wished for the wings of an eagle, that I might fly away to those happy seats; but the genius told me there was no passage to them, except through the gates of death that I saw opening every moment upon the bridge. The Islands, said he, that lie so fresh and green before thee, and with which the whole face of the ocean appears spotted, as far as thou canst see, are more in number than the sand on the sea shore: there are myriads of islands behind those which thou here discoverest, reaching farther than thine eye, or even thine imagination can extend itself. These are the mansions of good men after death, who, according to the degree and kinds of virtue in which they excelled, are distributed among these several islands, which abound with pleasures of different kinds and degrees, suitable to the relishes and perfections of those who are settled in them; every island is a paradise, accommodated to its respective inhabitants. Are not these, O Mirza habitations worth contending for? Does life appear miserable that gives thee opportunities of earning such a reward? Is death to be feared, that will convey thee to so happy an existence? Think not man was made in vain, who has such an eternity reserved for him—I gazed with unexpressible pleasure on these happy islands. At length said I, Show me now, I beseech thee, the secrets that lie hid under those dark clouds which cover the ocean, on the other side of the rock of adamant. The genius making me no answer, I turned about to address myself to him a second time, but I found he had left me. I then turned again to the vision I had been so long contemplating; but instead of the rolling tide, the arched bridge, and the happy islands, I saw nothing but the long hollow valley of Bagdad, with oxen, sheep, and camels, grazing upon the sides of it.

ADDISON.

# LESSON XIII.

## THE GRAVES OF A HOUSEHOLD.

They grew in beauty, side by side,
They filled our house with glee;
Their graves are sever'd far and wide,
By mountain, stream, and sea.
The same fond mother bent at night
O'er each fair sleeping brow,
She had each folded flower in sight.—
Where are those dreamers now?

One, 'midst the forests of the west,
By a dark stream is laid;
The Indian knows his place of rest,
Far in the cedar's shade.
The sea, the blue lone sea, hath one,
He lies where pearls lie deep;
He was the loved of all, yet none
O'er his low bed may weep;

One sleeps, where southern vines are drest
Above the noble slain;
He wrapp'd his colours round his breast,
On a blood-red field of Spain.
And one, o'er her the myrtle showers
Its leaves by soft winds fann'd,
She faded 'midst Italian bowers,
The last of that bright band.

And parted thus they rest, who play'd
Beneath the same green tree;

Whose voices mingled as they pray'd
Around one parent knee.
They, that with smiles lit up the hall
And cheer'd with mirth the hearth—
Alas for love! if this were all,
And naught beyond the earth!

Mrs. Hemans.

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### SEPARATION.

Friend after friend departs,
Who hath not lost a friend?
There is no union here of hearts
That finds not here an end!
Were this frail world our final rest,
Living or dying, none were blest.

Beyond the flight of time,—
Beyond the reign of death,—
There surely is some blessed clime,
Where life is not a breath;
Nor life's affection transient fire,
Whose sparks fly upward and expire.

There is a world above,
Where parting is unknown;
A long eternity of love,
Form'd for the good alone;
And faith beholds the dying here
Translated to that glorious sphere

Thus star by star declines,
Till all are past away;
As morning high and higher shines,
To pure and perfect day:
Nor sink those stars in empty night,
But hide themsevles in heaven's own light.

MONTGOMERY.

## LESSON XIV.

### ACCOUNT OF THE PRINCIPAL HEATHEN GODS.

Before the birth of our Saviour, the Jews were the only nation of the world who worshipped the true God. All the other nations worshipped different imaginary beings which existed only in their uninstructed fancies. Most of these false gods have now become forgotten, together with the nations that believed in them; yet it is necessary to preserve a knowledge of the imaginary gods and goddesses worshipped by the Greeks and Romans, as they are much spoken of in the finest writings of antiquity, and are still occasionally mentioned both in poetry aud prose. The most ancient of these their ideal gods were Chaos, and his son Erebus; or, confusion and darkness. Saturn, one of their descendants, is the same as Time: his reign is called the Golden Age; and it is said that the earth then produced corn and fruits without labour, and justice prevailed among all mankind. Saturn was said to be deposed by his son Jupiter, called also Jove; who then divided his father's power between himself and his two brothers, Neptune and Pluto. Jupiter was to reign over heaven: and he was said to hold his court, or council of the gods, on the top of Olympus, a mountain in Thessaly. He is called, by the ancient poets, the king of gods and men; and the eagle is represented as being the bearer of his thunderbolts. Neptune, the god of the sea, is represented with a trident, or fork with three teeth, in his hand, instead of a sceptre. He was supposed to be drawn in a chariot by sea-horses with his son, Triton, blowing a trumpet made of shell, and dolphins playing round him. The dominions of Pluto, the god of the infernal regions, were called Tartarus and Elysium. Tartarus was the place where the souls of the wicked were punished, and Elsyium was the scene of perpetual happiness allotted to the good. The passage from the earth to these regions was across the river Acheron, over which the departed spirits were conveyed by an old boatman, named Charon; and the farther bank was also guarded by a dog with three heads, named Cerberus. There were two remarkable rivers of hell: one named Styx, which the gods used to swear by when they intended to make their oath very solemn; and another named Lethe, which caused whoever bathed in it to forget what was past. Mars, said to be the son of Jupiter, was the god of war. Apollo, likewise the son of Jupiter, was the god of music, poetry and medicine. He is also represented as driving the chariot of the sun, drawn by four horses abreast; or rather, he was the sun itself. A story is told of him, that as a mark of affection, he intrusted this chariot one day to his son Phæton; who was killed by being thrown out of it, but not till after he had set a part of the earth on fire. Apollo is also called Phœbus, and Hyperion; and is represented as a beautiful young man without a beard, and with graceful hair. Mercury, a son of Jupiter, was the messenger of the gods; and is therefore represented with wings to his cap and his feet. He was said to be the inventor of letters, and hence he is the god of eloquence; and was the god of trade, and thence also of thieves. He was called also Hermes; and is represented as carrying a wand, called caduceus, with two serpents twisted round it. Vulcan, the god of fire and smiths, was the artificer of heaven; and made the thunderbolts of Jupiter, and the armour and palaces of the gods. His name and occupation are supposed to be derived from some obscure tradition of Tubal-Cain, one of the descendants of Cain, who was an instructor of every artificer in brass and iron. He once, as the story is told, offended Jupiter, who kicked him out of heaven; and falling on the island of Lemnos, he broke his leg, and was lame ever after. It is said that one of his principal forges was within Mount Etna. He is called also Mulciber.

The foregoing are the principal gods of this strange system of mythology, but there were many of a second or still lower order. Thus, Bacchus was the god of wine, and was crowned with leaves of the vine and the ivy. Eolus was the god of the winds; the north wind was called Boreas, the south wind Auster, the east wind Eurus, and the west wind Zephyrus. Momus was the god of satire, and likewise of laughter and jokes. Plutus was the god of riches. Hymen was the god of marriage: he is represented with the burning torch. Cupid was the god of love: he is represented as a beautiful child, but blind or hoodwinked, and carries a bow and arrows. Janus, a god with two faces, looking forward and backward, had a temple which was open in time of war, and shut in peace. Esculapius was an inferior god of medicine, below Apollo: he is represented as accompanied by a serpent, which was thought the most long lived of all animals. Pan was the god of shepherds; his lower parts have the figure of a goat, and he is represented as having horns, and as carrying a musical instrument similar to that now called Pan's pipes. There were other rural deities called Satyrs, Fauns, and Sylvans; their figures were half man and half goat, and they dwelt chiefly in forests. Every river, also, was supposed to have its own god, who was drawn with a long beard, a crown of reeds, and leaning on an urn. There were likewise a great number of demi-gods, or half-gods, who were supposed to have a god for their father and a woman for their mother; the principal one of these was Hercules, who was accounted the god of strength, from his having performed some wonderful undertakings, called his Twelve Labours. He is represented leaning on a large club, and wearing a lion's skin.

BALDWIN.

## AUBURN.

Sweet Auburn, loveliest village of the plain,
Where health and plenty cheer'd the lab'ring swain;
Where smiling spring its earliest visit paid;
And parting summer's ling'ring blooms delay'd.
Dear lovely bowers of innocence and ease,
Seats of my youth, where ev'ry sport could please,
How often have I loiter'd o'er thy green,
Where humble happiness endear'd each scene;

How often have I paused on every charm,
The shelter'd cot, the cultivated farm,
The never-failing brook, the busy mill,
The decent church that topt the neighb'ring hill;
The hawthorn bush, with seats beneath the shade,
For talking age, and whisp'ring lovers made.
Sweet was the sound, when oft, at evening's close,
Up yonder hill the village murmur rose;
There, as I pass'd, with careless steps and slow,
The mingling notes came soften'd from below
The swain, responsive, as the milk-maid sung;
The sober herd that low'd to meet their young;
The noisy geese, that gabbled in the pool;
The playful children, just let loose from school;
The watch-dog's voice that bay'd the whisp'ring wind,
And the loud laugh that spoke the vacant mind:
These all in sweet confusion sought the shade,
And fill'd each pause the nightingale had made.

GOLDSMITH.

## LESSON XV.

### WHY AN APPLE FALLS.

Papa (said Lucy), I have been reading to-day, that Sir Isaac Newton was led to make some of his great discoveries by seeing an apple fall from a tree. What was there extraordinary in that?

*P.* There was nothing extraordinary; but it happened to catch his attention, and set him a thinking.

*L.*—And what did he think about?

*P.*—He thought by what means the apple was brought to the ground.

*L.*—Why, I could have told him that—because the stalk gave way, and there was nothing to support it.

*P*—And what then ?

*L.*—Why then—it must fall, you know.

*P.*—But why must it fall ?—that is the point.

*L.*—Because it could not help it.

*P.*—But why could it not help it.

*L.*—I dont't know—that is an odd question. Because there was nothing to keep it up.

*P.*—Suppose there was not—does it follow that it must come to the ground ?

*L.*—Yes, surely !

*P.*—Is an apple animate or inanimate ?

*L.*—Inanimate, to be sure !

*P.*—And can inanimate things move of themselves ?

*L.*—No—I think not—but the apple falls because it is forced to fall.

*P.*—Right ! some force out of itself acts upon it, otherwise it would remain for ever where it was, notwithstanding it were loosened from the-tree.

*L.*—Would it ?

*P.*—Undoubtedly ! for there are only two ways in which it could be moved ! by its own power of motion, or the power of somewhat else moving it. Now, the first you acknowledge it has not ; the cause of its motion must, therefore, be the second. And what that is, was the subject of the philosopher's inquiry.

*L*—But every thing falls to the ground as well as an apple, when there is nothing to keep it up.

*P.*—True—there must, therefore, be a universal cause of this tendency to fall.

*L.*—And what is it?

P.—Why, if things out of the earth cannot move themselves to it, there can be no other cause of their coming together, than that the earth pulls them.

*L.*—But the earth is no more animate than they are; so how can it pull?

*P.*—Well objected! this will bring us to the point. Sir Isaac Newton, after deep meditation, discovered that there was a law in nature called *attraction*, by virtue of which every particle of matter, that is, every thing of which the world is composed, draws towards it every other particle of matter, with a force proportioned to its size and distance. Lay two marbles on the table. They have a tendency to come together, and if there were nothing else in the world, they would come together, but they are also attracted by the table, by the ground, and by every thing besides in the room; and these different attractions pull against each other. Now, the globe of the earth is a prodigious mass of matter, to which nothing near it can bear any comparison. It draws, therefore, with mighty force every thing within its reach, which is the cause of their falling; and this is called the *gravitation* of bodies, or what gives them *weight*. When I lift up any thing, I act contrary to this force, for which reason it seems *heavy* to me, and the heavier, the more matter it contains, since that increases the attraction of the earth for it. Do you understand this?

*L.*—I think I do. It is like a loadstone drawing a needle.

*P.*—Yes—that is an attraction, but of a peculiar kind, only taking place between the magnet and iron. But gravitation, or the attraction of the earth, acts upon every thing alike.

*L.*—Then it is pulling you and me at this moment ?

*P.*—It is.

*L.*—But why do we not stick to the ground then ?

*P.*—Because we are alive ; we have a power of self-motion, which can, to a certain degree, overcome the attraction of the earth. But the reason you cannot jump a mile high as well as a foot, is this attraction, which brings you down again after the force of your jump is spent.

*L.*—I think then I begin to understand what I have heard of people living on the other side of the world. I believe they are called *Antipodes*, who have their feet turned towards ours, and their heads in the air. I used to wonder how it could be that they did not fall off ; but I suppose the earth pulls them to it,

*P.*—Very true. And whither should they fall ? What have they over their heads ?

*L* —I don't know—sky, I suppose.

*P.*—They have. The earth is a vast ball, hung in the air, and continually spinning round, and that is the cause why the sun and stars seem to rise and set. At noon we have the sun over our heads, when the Antipodes have the stars over theirs ; and at midnight the stars are over our heads, and the sun over theirs. So whither should they fall to more than we ? to the stars or the sun ?

*L.*—But we are up, and they are down.

*P.*—What is up, but *from* the earth and *toward* the sky ? Their feet touch the earth and their heads point to the sky as well as ours. If a hole were dug quite through the earth, what would you see through it?

*L.*—Sky, with the sun or the stars: and now I see the whole matter plainly. But pray, what supports the earth in the air?

*P.*—Why, where should it go?

*L.*—I don't know—I suppose where there was most to draw it. I have heard that the sun is a great many times bigger than the earth. Would it not go to that?

*P.*—You would have thought very justly on the matter I perceive. But I shall take another opportunity of showing you how this is, and why the earth does not fall into the sun, of which, I confess, there seems to be some danger. Meanwhile, think how far the falling of an apple has carried us!

*L.*—To the Antipodes, and I know not where

*P.*—You may see thence what use may be made of the commonest fact by a thinking mind.

*Evenings at Home.*

## TIMES AND SEASONS.

The lark has sung his carol in the sky;
The bees have humm'd their noontide lullaby
Still in the vale the village bells ring round,
Still in Llewellyn-hall the jests resound;
For now the caudle-cup is circling there,
Now, glad at heart, the gossips breathe their prayer,
And, crowding, stop the cradle to admire
The babe, the sleeping image of his sire.

A few short years—and then these sounds shall hail
The day again, and gladness fill the vale;
So soon the child a youth, the youth a man,
Eager to run the race his fathers ran.
Then the huge ox shall yield the broad sirloin;
The ale, now brew'd, in floods of amber shine;
And basking in the chimney's ample blaze,
Mid many a tale told of his boyish days,
The nurse shall cry, of all her ills beguiled,
" 'Twas on these knees he sat so oft and smiled."

And soon again shall music swell the breeze;
Soon, issuing forth, shall glitter through the trees
Vestures of nuptial white; and hymns be sung,
And violets scatter'd round; and old and young,
In every cottage porch with garlands green,
Stand still to gaze, and gazing, bless the scene:
While, her dark eyes declining by his side
Moves in her virgin-veil the gentle bride.

And once, alas! nor in a distant hour,
Another voice shall come from yonder tower;
When in dim chambers long black weeds are seen,
And weeping's heard where only joy has been;
When by his children borne, and from his door
Slowly departing to return no more,
He rests in holy earth with them that went before.

ROGERS.

## LESSON XVI.

### ACCOUNT OF THE PRINCIPAL HEATHEN GODDESSES.

Juno was said to be the wife of Jupiter, and, of course, the queen of heaven. She is represented as drawn by peacocks in a chariot of gold. Her favourite messenger was Iris, the goddess of the rainbow. Minerva, a daughter of Jupiter, was the godddss of wisdom and of war, She was represented in complete armour, bearing a shield (called ægis) with a head on it, so terrible, that every one who looked on it was said to be turned into stone. She was likewise the patroness of spinning, needle work, and embroidery. She was called also Pallas, and her principal emblem was an owl. Diana was the twin-sister of Apollo; and as he drove the chariot of the sun, so she presided in that of the moon. She was the goddess of hunting; and is drawn carrying a bow and arrows, with a half moon as an ornament on her forehead, and attended by several nymphs as her companions, and by her hounds; she was likewise called the goddess of chastity. She is called also Phœbe, and Cynthia, from having been born on Mount Cynthus; and she had a very famous temple at Ephesus, which is mentioned in the New Testament in the 19th chapter of the Acts. Venus was the goddess of beauty and of love, and the wife of Vulcan, and mother of Cupid: her chariot was drawn by doves, and the myrtle was sacred to her. She is said to have sprung from the sea, near the island of Cythera; and her most celebrated temple was at the city of Paphos, in the island of Cyprus: hence she is called also Cytherea; and the Paphian or

Cyprian, goddess. She was famous for her cestus, or girdle, which had the power of giving to any female who wore it irresistable charms in the eyes of whomsoever she wished to please: but young women may still find the true girdle of Venus to be good humour. Vesta was the goddess of the earth and of fire. In her temple at Rome a perpetual fire was maintained which was kindled from the rays of the sun, and was constantly watched by priestesses chosen from the most noble families. They were called Vestal virgins, and had very great honours and privileges. Ceres was the goddess of corn and of harvests. Cybele was one of the most ancient of the goddesses, being the wife of Saturn; and in some respects represents the earth. She is displayed as crowned with towers, holding a key in her hand, and drawn in a chariot by lions. Proserpine was the wife of Pluto and, of course, the queen of the infernal regions. She was the daughter of Ceres. Amphitrite was the wife of Neptune. Her sister was Thetis, another sea goddess; and hence, when the sun sets, he is said to sink into the lap of Thetis.

Flora was the goddess of flowers, and Pomona of fruits. Bellona was an inferior goddess of war. Aurora was the goddess of morning, or rather of day-break. Themis, the sister of Saturn, was the goddess of righteousness and justice: her daughter Astrea also represented justice: she is sometimes called the Virgin, and in this character has a place among the stars, being denoted by the constellation Virgo (or the virgin). Hygeia was the goddess of health. Hebe was the goddess of youth, and was cup-bearer to Jupiter.

Ate was the goddess of mischief. The Muses were nine virgin goddesses who presided over every kind of learning, and in that character attended on Apollo. They were sisters; the principal of them were—Clio, who was the muse of history; Thalia, of comedy: Melpomene, of tragedy: Terpsichore, of dancing; and Urania, of mathematics and astronomy. They are sometimes called merely the Nine in reference to their number. Parnassus and Helicon were two mountains sacred to Apollo and the Muses; at the feet of which flowed two streams, whose waters were supposed to communicate the inspiration of prophecy or of poetry. Pegasus was a winged horse of the Muses. The Graces were three sisters, likewise virgins. They were supposed to give its attractive charms to beauty of every kind, and so dispense the gift of pleasing. The Furies were three sisters of a very different character: they were the most deformed and horrible of all the imaginary deities. Instead of hair they had snakes hanging from their heads. They carried chains and whips with lashes of iron or of scorpions in one hand, and lighted torches in the other. They were supposed to be the bearers of the vengeance of heaven. The Destinies, or Fates, were also three sisters, of whom one was represented as holding a distaff; another drawing from it a thread, signifying the life of man, and the third with a pair of shears, ready to cut the thread whenever she should choose. The Dryads and Hamadryads were rural goddesses, each having a single tree in her charge. The Naiads were goddesses presiding over springs, wells, and fountains; each in the same manner having one under her care. The Nereids were inferior goddesses of the sea.

BALDWIN.

## THE VOICE OF SPRING.

I come, I come! ye have call'd me long,
I come o'er the mountains with light and song.
Ye may trace my steps o'er the waking earth,
By the winds which tell of the violet's birth,
By the primrose stars in the shadowy grass,
By the green leaves opening as I pass.

I have breathed on the South, and the chestnut flowers
By thousands, have burst from the forest-bowers;
And the ancient graves, and the fallen fanes,
Are veil'd with wreaths on Italian plains.
—But it is not for me, in my hour of bloom,
To speak of the ruin or the tomb!

I have pass'd o'er the hill of the stormy North,
And the larch has hung all his tassels forth,
The fisher is out on the sunny sea,
And the rein-deer bounds through the pasture free,
And the pine has a fringe of softer green,
And the moss looks bright where my step has been.

I have sent through the wood-paths a gentle sigh,
And called out each voice of the deep-blue sky,
From the night-birds lay through the starry-time,
In the groves of the soft Hesperian clime,
To the swan's wild note by the Iceland lakes,
When the dark fir-bough into verdure breaks.

From the streams and founts I have loosed the chain;
They are sweeping on to the silvery main,

They are flashing down from the mountain-brows,
They are flinging spray on the forest boughs,
They are bursting fresh from their sparry caves,
And the earth resounds with the joy of waves.

Come forth, O ye children of gladness, come!
Where the violets lie may now be your home.
Ye of the rose-cheek and dew-bright eye,
And the bounding footstep to meet me fly,
With the lyre, and the wreath, and the joyous lay,
Come forth to the sunshine, I may not stay.

Away from the dwellings of care-worn men,
The waters are sparkling in wood and glen;
Away from the chamber and dusky hearth,
The young leaves are dancing in breezy mirth;
Their light stems thrill to the wild wood strains,
And youth is abroad in my green domains.

MRS. HEMANS.

## LESSON XVII.

### ON THE THERMOMETER AND BAROMETER.

The thermometer shows the variations in the temperature of the weather. It is a hollow ball of glass, and a long tube partly filled with mercury, or spirits of wine, coloured, so as to be seen when it rises. The ball is plunged into boiling water, which causes the fluid with which it is filled to expand, and at this point, which is called the boiling point, the tube is broken off, and hermetically sealed; that is, the neck of the tube being heated up it is just ready to melt, is twisted with a pair of hot pincers. The ball is then plunged into a freezing mixture, which causes the fluid to contract; this is called the freezing point, and is marked 32° on a graduated scale which is attached to the tube. On the same scale, the boiling point is marked 212°.

The thermometer most used in this country is that of Fahrenheit; though the centigrade, or thermometer of a hundred degrees, first invented in Sweden, and now generally employed on the continent, is in many respects preferable.

A thermometer enables us to know with accuracy the real degree of heat, as our own feelings are very deceptive. According to the state of their health at the time, different persons will give a different judgment on the subject. After hot weather, a day which is not very cold, will yet feel so to us; and after cold weather we shall be ready to think a day warm, which is not so severe as the preceding. In winter a thermometer in a sitting-room enables us to regulate its heat. It is not in warm climates that persons affected with pulmonary complaints are most relieved, but in such as that of the island of Madeira, where the sea breezes abate the summer heat and the cold of winter is not felt. Patients who find it impossible to remove to a warm climate, may greatly benefit themselves by keeping up a regular temperature of about 60 or 62 degrees in their apartments. Experiments will show how differently the feelings of different individuals may be affected by the same degree of heat. Pour warm water into one basin, cold into a second, and a mixture of hot and cold in a third; then put one hand into the cold water, and the other into the warm: in a short time put them both in the lukewarm water, and to the one hand it will feel hot, to the other cold. Persons ascending from the burning shores of La Vera Cruz, on the road to the mountain land of Mexico, will feel the climate become colder, and will put on their great coats, and yet they will meet people descending who complain of the heat.

The thermometer is much used in chemical experiments and in arts. Brewers ascertain the state of their liquors in all their operations by means of a thermometer; and without this instrument, could proceed only by guess, and therefore with risk.

A *barometer* is an instrument which indicates the state of the weather, by showing the state of the atmosphere. It is extremely simple in its construction, and consists of a glass tube, about three feet in length, and open only at one end. This tube must first be filled with mercury, then stopping the open end with the finger, it is immersed in a cup which contains a little mercury. Part of the mercury which was in the tube now falls down into the cup, leaving a vacant space in the upper part of the tube, to which the air cannot gain access. This space is therefore a perfect vacuum; and consequently the mercury in the tube is relieved from the pressure of the atmosphere, whilst that in the cup remains exposed to it: therefore the pressure of the air on the mercury in the cup supports that in the tube, and prevents it from falling. This simple apparatus is all that is essential to the barometer. The tube and cup are fastened to a graduated board, for the purpose of ascertaining the height at which the mercury stands in the tube. The weight of the atmosphere sustains the mercury at the height of about $29\frac{1}{2}$ inches ; but the height depends upon the weight of the atmosphere, which varies according to the state of the weather. The greater the pressure of the air on the mercury in the cup, the higher it will ascend in the tube. The air, therefore, is generally heaviest in dry weather, for the mercury rises in the tube, and consequently that in the cup sustains the greatest pressure ; and thus we estimate the dryness and fairness of the weather by the height of the mercury. We are apt to think the air feels heavy in bad weather, because it is less salubrious when impregnated with damp. The lungs, under these circumstances, do not play so freely, nor does the blood circulate so well.

As the atmosphere diminishes in density in the upper regions, the air must be more rare upon a hill than in a plain ; and this difference may be ascertained by the barometer. This instrument is so exact in its indications, that it is used for the purpose of measuring the height of mountains, and of estimating the elevation of balloons.

## LESSON XVIII.

### ON THE MICROSCOPE.

Microscopes are instruments for viewing small objects, and they apparently magnify objects, because they enable us to see them nearer than with the naked eye, without affecting the distinctness of vision. By making a pin-hole through a piece of brown paper, then bringing the eye close to the hole, and the paper within two or three inches of any small object, the object will apparently be much magnified, though without the paper it would at that distance have been imperceptible. *Single microscopes*, of the greatest power, are very small globules of glass, which are made by melting the ends of fine threads of glass in the flame of a candle; or by taking a little fine powdered glass on the point of a very small needle, and melting it into a globule. With such microscopes as these, Lewenhoek made all his wonderful discoveries. The most wonderful single microscopes are those lately made of diamond. The *compound microscope* consists of at least two lenses, by one of which an image is formed, and this image is viewed through the other lens, called the eye-glass, instead of the object itself, as in the single microscope. The *solar microscope* is a kind of a camera obscura, which, in a darkened chamber, throws the image on a wall or screen. It consists of two lenses fixed opposite a hole in a board or window-shutter.

The wonderful works of God are seen in the minutest as well as in the largest objects.

As our senses are not sufficiently acute, the organization of very small objects often escapes observation, unless we have recourse to foreign assistance. The microscope has opened to us a new world of insects and vegetables; it has taught us, that objects invisible to the naked eye, exist, having figure, extension, and different parts. One of the most wonderful displays of nature is a drop of putrid water, as exhibited by a powerful microscope: it is full of living creatures of strange shapes, and the rapidity with which they appear to move is perfectly astonishing. In the mould of vegetables we see a thick forest of trees and plants, bearing leaves, branches, flowers, and fruits. Little as we should have expected to find these in such a bed, as little should we have supposed the dust upon the wings of a butterfly to be minute feathers, or the bloom of a peach to be a collection of insects, had not the microscope furnished us with this intelligence.

Upon examining the edge of a very keen razor with a microscope, it will appear as broad as the back of a thick knife: rough, uneven, full of notches and furrows. An exceedingly small needle, resembles a rough iron bar. But the sting of a bee, seen through the same instrument, exhibits every where a polish most amazingly beautiful, without the least flaw, blemish, or inequality, and it ends in a point too fine to be discerned. A small piece of exceedingly fine lawn appears, through a microscope, like a hurdle or lattice, and the threads themselves seem coarser than the yarn with which ropes are made for anchors. But a silkworm's web appears perfectly smooth and shining, and every where equal. The smallest dot that can be made with a pen, appears, when viewed by the microscope, an irregular spot, rough, jagged, and uneven. But the little specks on the wings or bodies of insects are found to be most accurately circular. The finest miniature paintings appear before this instrument as mere daubings, plastered on with a trowel, entirely void of beauty, either in the drawing or the colouring. The most even and beautiful varnishes and polishings, will be found to be mere roughness, full of gaps and flaws. Thus sink the works of art before the microscopic eye. But the nearer we examine the works of God, even in the least of his productions, the more sensible shall we be of his wisdom and power. Apply the microscope to any, the most minute of his works, nothing is to be found but beauty and perfection. If we examine the numberless species of insects that swim, creep, or fly around us, what proportion exactness uniformity, and symmetry, shall we perceive in all their organs! what a profusion of colouring! azure, green, and vermilion, gold, silver, pearls, rubies, and diamonds: fringe and embroidery, on their bodies, wings, heads, and every other part! how high the finishing! how inimitable the polish we every where behold! The most perfect works of man betray a meanness, a poverty, an inability in the workman; but the works of nature plainly prove that the hand which formed them was Divine.

PLATT'S *Class Book.*

How sweet to muse upon this skill display'd!
Infinite skill! in all that he has made;
To trace in Nature's most minute design
The signature and stamp of power Divine;
Contrivance exquisite, express'd with ease,
Where unassisted sight no beauty sees;
The shapely limb, and lubricated joint
Within the small dimensions of a point;
Muscle and nerve miraculously spun,
His mighty work who speaks, and it is done.
Th' invisible in things scarce seen reveal'd;
To whom an atom is an ample field.

COWPER.

# LESSON XIX.

## WHY THE EARTH MOVES ROUND THE SUN.

You remember (said her Papa to Lucy.) that I explained to you some time ago what was the cause that things fell to the ground.

*L.*--O, yes!--it was because the ground drew them to it.

*P.*--True. That is a consequence of the universal law in nature, that bodies attract each other in proportion to their mass. So a small quantity of matter, in the neighbourhood of a large quantity, always tends to go to it, if not prevented by some other power. Well--you know I told you that the sun was a ball a vast many times bigger than the ball we inhabit, called the earth: upon which you properly asked, how then it happened that the earth did not fall into the sun.

*L.*--And why does it not?

*P.*--That I am going to explain to you. You have seen your brother twirl round an ivory ball tied to the end of a string which he held in his hand.

*L.*--Yes--and I have done it myself too.

*P.*--Well then you felt that the ball was continually pulling, as if it tried to make its escape.

*L.*--Yes; and one my brother was swinging *did* make its escape, and flew through the sash.

*P.*--It did so. That was a lesson in the *centrifugal* motion, or that power by which a body thus whirled continually endeavours to fly off from the centre round which it moves. This is owing to the force or impulse you give it in setting out, as if you were going to throw it away from you. The string by which you hold it, on the contrary, is the power which keeps the ball towards the centre, called the *centripetal* power. Thus, you see there are two powers acting upon the ball at the same time : one to make it fly off, the other to hold it in ; and the consequence is, that it moves directly according to neither but between both ; that is round and round. This it continues to do while you swing it properly ; but if the string breaks or slips off, away flies the ball ; on the other hand, if you cease to give it the whirling force, it falls towards your hand.

*L.* I understand all this.

*P.*--I will give you another instance of this double force acting at the same time. Do not you remember seeing some curious feats of horsemanship ?

*L.*--Yes.

*P.*—One of them was, that a man standing with one leg upon the saddle and riding full speed, threw up balls into the air, and catched them as they fell.

*L.*--I remember it very well.

*P.*--Perhaps you would have expected these balls to have fallen behind him, as he was going at such a rate.

*L.*--So I did.

*P.*--But you saw that they fell into his hands as directly as if he had been standing quite still. That was because, being carried along with him they had, when they were thrown upwards, the motion of the horses straight forwards, as well as the upright motion that he gave them ; so that they made a slanting line through the air, and came down in the same place which they would have reached if he had held them in his hand all the while.

L.—That is very curious indeed !

*P.*—In the same manner, you may have observed in riding in a carriage, that if you throw anything out of the window, it falls directly opposite, just as if the carriage was standing still, and is not left behind you.

*L.*—I will try that the next time I ride in one.

*P.*—You are then to imagine the sun to be a mighty mass of matter, many thousand times bigger than our earth. You are to conceive our earth, as soon as created, launched with great force in a straight line, as if it were a bowl on the green. It would have flown off in this line for ever, through the boundless regions of space, had it not at the same instant received a pull from the sun by its attraction. By the wonderful skill of the Creator these two forces were made exactly to counterbalance each other ; so that just as much as the earth, from the original motion given it, tends to fly forwards, just so much the sun draws it to the centre ; and the consequence is, that it takes a course between the two, which is a circle round and round the sun.

*L.*—But if the earth was set a rolling like a bowl upon a green, I should think it would stop of itself, as the bowl does.

*P.*—The bowl stops because it is continually rubbing against the ground, which checks its motion ; but the ball of the earth moves in empty space, where there in nothing to stop it.

*L.*—But if I throw a ball through the air, it will not go on for ever, but it will come down to the ground.

*P.*—That is because the force with which you can throw it is less than the force by which it is drawn to the earth. But there is another reason too, which is the resistance of the air. This space all around us and over us is not empty space; it is quite full of a thin transparent fluid called air.

*L.*—Is it?

*P.*—Yes. If you move your hand quickly through it, you will find something resisting you, though in a slight degree. And the wind, you well know, is capable of pressing against anything with almost irresistible force; and yet wind is but a quantity of air put into a violent motion. Every thing then that moves through the air is continually obliged to push some of this fluid out of the way, by which means it is constantly losing part of its motion.

*L.*—Then the earth would do the same.

*P.*—No; for it moves in *empty space*.

*L.*—What! does not it move through the air?

*P.*—The earth does not move *through* the air, but hurries the air along with it. All the air is contained within the space called the *atmosphere*, which you may compare to a kind of mist or fog clinging all round to the ball of the earth, and reaching a certain distance above it, which has been calculated at above forty-five miles.

*L.*—That is above the clouds, then?

*P.*—Yes: all the clouds are within the atmosphere, for they are supported by the air. Well—this atmosphere rolls about along with the earth, as if it were a part of it, and moves with it through what we call the heavens. In this immense space are all the stars and planets, which have all their several motions. There is nothing to stop them, but they continually go on, by means of the force that the Creator has originally impressed upon them.

*L.*—Do not some of the stars move round the sun, as well as our earth ?

*P.*—Yes ; those that are called *planets.* These are all subject to the same laws of motion with our earth. They are attracted by the sun as their centre, and form, along with the earth, that assemblage of worlds, which is called the *solar system.*

*L.*—Is the moon one of them ?

*P.*—The moon is called a *secondary* planet, because its immediate connexion is with our earth, round which it rolls, as we do round the sun. It, however, accompanies our earth on its journey round the sun. But I will tell you more about its motion, and about the other planets and stars, another time. It is enough at present, if you thoroughly understand what I have been describing.

*L.*—I think I do.

## LESSON XX.

### DETACHED PIECES.

Not always tempt the distant deep,
Nor always timorously creep
Along the treach'rous shore. *Horace*

And is this all ? Can reason do no more
Than bid me shun the deep, and dread the shore ?
Sweet moralist ! afloat on life's rough sea,
The Christian has an art unknown to thee ;
He holds no parley with unmanly fears,
Where duty bids he confidently steers ;
Faces a thousand dangers at her call,
And trusting in his God surmounts them all.

COWPER.

Tell me what Genius did the art invent,
The lively image of the voice of paint ;
Who first the secret, how to colour sound,
And to give shape to reason, wisely found ;
With bodies, how to clothe ideas, taught ;
And how to draw the picture of a thought :
Who taught the hand to speak, the eye to hear,
A silent language roving far and near ;
Whose softest noise outstrips loud thunder's sound,
And spreads her accents through the world's vast round ;

A voice heard by the deaf, spoke by the dumb,
Whose echo reaches long, long time to come :
Which dead men speak as well as those alive :—
Tell me what Genius did this art contrive ?

The noble art to Cadmus owes its rise
Of painting words, and speaking to the eye :
He first in woundrous magic fetters bound
The airy voice, and stopp'd the flying sound,
The various figures, by his pencil wrought,
Gave colour, form, and body to the thought.

Cowper.

There is a pow'r
Unseen, that rules the illimitable world,
That guides its motions from the brightest star
To the least dust of this sin-tainted mould ;
While man, who madly deems himself the lord
Of all, is nought but weakness and dependence.
This sacred truth, by sure experience taught,

Thou must have learnt when wandering all alone,
Each bird, each insect, flitting through the sky,
Was more sufficient for itself than thou.

THOMSON.

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Reflect that life and death, affecting sounds,
Are only varied modes of endless being.
Reflect that life, like every other blessing,
Derives its value from its use alone:
Nor for itself, but for a nobler end,
Th' Eternal gave it and that end is virtue.
When inconsistent with a greater good,
Reason commands to cast the less away;
Thus life, with loss of wealth, is well preserved,
And virtue cheaply saved with loss of life.

JOHNSON.

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When one who holds communion with the skies,
Has fill'd his urn where the pure waters rise,
And once more mingles with us meaner things,
'Tis even as if an angel shook his wings;
Immortal fragrance fills the circuit wide,
And tells us where his treasure is supplied.

COWPER.

---

As on thy mother's knee a new-born child,
Weeping thou sat'st, whilst all around thee smiled,
So live, that, sinking into death's long sleep,
Calm thou mayest smile, whilst all around thee weep.

HAFIZ.

# LESSON XXI.

## THE FIRST SABBATH.

Here finished he, and all that he had made
View'd and behold all was entirely good ;
So even and morn accomplish'd the sixth day :
Yet not till the Creator, from his work
Desisting, though unwearied, up return'd,
Up to the heaven of heavens, his high abode ;
Thence to behold this new created world,
The addition of his empire, how it show'd
In prospect from his throne, how good, how fair,
Answering his great idea. Up he rode,
Follow'd with acclamation, and the sound
Symphonious of ten thousand harps, that tuned
Angelic harmonies : the earth, the air
Resounded (thou remember'st, for thou heardst,
The heavens and all the constellations rung,
The planets in their station listening stood,
While the bright pomp ascended jubilant.
" Open, ye everlasting gates ! " they sung,
" Open, ye heavens, your living doors ; let in
The great Creator from his work return'd
Magnificent, his six days' work, a world ;
Open, and henceforth oft ; for God will deign
To visit the dwellings of just men,
Delighted ; and with frequent intercourse
Thither will send his winged messengers
On errands of supernal grace."—So sung
The glorious train, ascending : he through heaven,

That open'd wide her blazing portals, led
To God's eternal house direct the way;
A broad and ample road, whose dust is gold,
And pavement, stars, as stars to thee appear
Seen in the galaxy, that milky-way
Which nightly, as a circling zone, thou seest
Powder'd with stars. And now on earth the seventh
Evening rose in Eden, for the sun
Was set, and twilight from the east came on,
Forerunning night; when at the holy mount
Of heaven's high-seated top, the imperial throne
Of Godhead fixed for ever firm and sure,
The Filial Power arrived, and sat him down
With his great Father there; and, from his work
Now resting, bless'd and hallow'd the seventh day,
As resting on that day from all his work
But not in silence holy kept: the harp
Had work, and rested not; the solemn pipe,
And dulcimer, all organs of sweet stop,
All sounds on fret by string or golden wire,
Temper'd soft tunings, intermix'd with voice
Choral or unison: of incense, clouds,
Fuming from golden censers hid the mount.
Creation and the six days' acts they sung:
"Great are thy works, Jehovah! infinite
Thy power! what thought can measure thee, or tongue
Relate thee? Greater now in thy return
Than from the giant angels: thee that day
Thy thunders magnified; but to create
Is greater than created to destroy.
Who can impair thee, Mighty King, or bound

Thy empire? Easily the proud attempt
Of spirits apostate, and their counsel vain,
Thou hast repell'd; while impiously they thought
Thee to diminish, and from thee withdraw
The number of thy worshippers. Who seeks
To lessen thee, against his purpose serves
To manifest the more thy might: his evil
Thou usest, and from thence createst more good.
Witness this new-made world, another heaven
From heaven-gate not far, founded in view
On the clear hyaline, the glassy sea;
Of amplitude almost immense, with stars
Numerous, and every star perhaps a world
Of destined habitations; but thou know'st
Their seasons: among these the seat of men,
Earth with her nether ocean circumfused,
Their pleasant dwelling place. Thrice happy men
And sons of men whom God hath thus advanced!
Created in his image there to dwell
And worship him; and in reward to rule
Over his works, on earth, in sea, or air,
And multiply a race of worshippers
Holy and just: thrice happy, if they know
Their happiness, and persevere upright!"
So sung they, and the empyrean rung
With hallelujahs: thus was the Sabbath kept.

MILTON.—*Paradise Lost.*

# APPENDIX.

## PREFIXES, AFFIXES, AND PRINCIPAL LATIN AND GREEK ROOTS.

OCCURRING IN THE FOURTH BOOK OF LESSONS.

## I.—PREFIXES.

### 1. ENGLISH.

A, *on.*
Be, *about, before, make.*
En, *make.*
Fore, *before.*
Mis, *error* or *defect.*
Out, *beyond.*
Over, *over* or *above.*
Un, *not.*
With, *from* or *against.*

### 2. LATIN.

A, ab, abs, *from*
Ad, (a, ac, af, ag, al, an, ap, ar, as, at,) *to.*
Am, *round, about.*
Ante, *before.*
Circum, (circu,) *about.*
Con, (co, cog, col, com, cor,) *together.*
Contra, *against.*
De, *down, from.*
Di, dis, (dif,) *asunder, not.*
E, ex, (ec, ef,) *out of.*
Extra, *beyond.*
In, (ig, il, em, im, ir,) *in, not.*
Inter, *between* or *among.*
Intro, *within.*
Juxta, *nigh to.*
Ob, (oc, of, op, os,) *in the way of.*
Per, (pel,) *through.*
Post, *after.*
Pre, *before.*
Preter, *beyond.*
Pro, (pur,) *forward.*
Re, *back* or *again.*
Retro, *backwards.*
Se, *aside* or *apart.*
Sine, *without.*
Sub, (suc, suf, sug, sup, sus,) *under.*
Subter, *beneath.*
Super, (sur,) *above.*
Trans, (tra,) *beyond.*
Ultra, *beyond.*

### 3. GREEK.

A, (*an,*) *without, not.*
Amphi, *both, round about.*
Ana, *through.*
Anti, (ant,) *against, in opposition to.*
Apo, (aph,) *from.*
Cata, (cat, cate, cath,) *from side to side.*
Dia, *through.*
Epi, (eph,) *upon.*
Hyper, *over, too.*
Hypo, *under.*
Meta, (meth,) *beyond.*
Para, (par,) *beside, near.*
Peri, *round.*
Syn, (sy, syl, sym,) *together.*

## II.—AFFIXES.

### 1. TO NOUNS.

| | | |
|---|---|---|
| An,<br>ant,<br>ar,<br>ard,<br>ary,<br>er, | *an agent,* or, *one who does.* | eer,<br>ent,<br>or,<br>iste,<br>ite,<br>ster, |
| Hood,<br>ism,<br>ment,<br>ness,<br>nce, | *state of being* or, *quality.* | ry,<br>ship,<br>tude,<br>ty,<br>y, |

dom, age, *action, state,* or, *property.*
cle, let, *little.*
ling, *young.*
tion, sion, *the act of doing,* or, *the thing done.*

### 2. TO ADJECTIVES.

| | | |
|---|---|---|
| Al,<br>an,<br>ar,<br>ary,<br>ory, | *of,* or, *belonging to.* | ic,<br>ile,<br>ine,<br>ish. |

| | |
|---|---|
| Ful,<br>ous,<br>ose,<br>some,<br>y, | *full.* |

ant, ent, *being.*
ble, *may,* or, *can be.*
en, *made of.*
ish, *little.*
less, *without.*
li, ish, like, *like.*
ward, *towards.*

### 3. TO VERBS.

| | |
|---|---|
| Ate,<br>en,<br>fy,<br>ish,<br>ize, | *to make.* |

### 4. TO ADVERBS.

Ly, *like,*
ward, *towards.*

## III.—LATIN AND GREEK ROOTS.

### SECTION I.

#### LESSON I.

Æquus, *equal*, as equ*alize*.

Ago, *I do;* actus, *done*, as ag*ent*, ac*tor*.

Altus, *high*, as alt*itude*.

Apto, *I fit*, as *ad*apt.

Domus, *a house*, as dom*estic*.

Duco, *I lead*, as *re*duce.

Durus, *hard*, as *en*dure.

Facio, *I make;* factus, *made*, (ficio and fectus when compounded) as fac*tor*, *bene*fic*ent*, *per*fect.

Fero, *I carry*, as *dif*fer.

Finis, *an end*, as *in*fin*ite*.

Mitto, *I send;* missus, *sent*, as *re*mit, miss*ionary*

Pello, *I drive*, as *com*pel.

Philos, (Gr.) *a friend*, as phi*losopher*.

Scribo, *I write;* scriptus, *written*, as *in*scribe, *de*scrip*tion*.

Sophos, (Gr.) *wise*, as soph*ist*.

Terra, *the earth*, as terr*estrial*.

#### LESSON II.

Capio, *I take;* captus, *taken*, (cipio and ceptus when compounded,) as capt*ive*, *re*cep*tion*.

Cavus, *hollow*, as *ex*cav*ate*.

Cedo, *I give place, I go;* cessio, *giving a place*, as *pro*ceed, *con*cess*ion*.

Jactus, *thrown*, (jectus when compounded,) as *re*ject.

Manus, *the hand* as manu*mit*.

Multus, *many* as multi*tude*.

Natus, *born*, as nat*ive*.

Pareo, *I appear*, as *trans*par*ent*.

Pono, *I place;* positus, *placed*, as *de*pose, *im*posit*ion*.

Quæro, *I ask;* quæsitus, *asked*, (quiro and quisitus when compounded,) as *in*quire, *re*quisit*ion*.

Scando, *I climb*, as *de*scend.

Verto, *I turn;* versus, *turned*, as *per*vert, *con*vers*ion*.

#### LESSON III.

Caro, carnis, *flesh*, as *in*carn*ate*.

Cura, *care*, as *sine*cure.

Facilis, *easy*, as facil*itate*, *dif*ficult.

Habeo, *I have;* habitus, *had*, (hibeo and hibitus when compounded,) as *in*habit, *ex*hibit.

Hostis, *an enemy*, as hostil*e*.

Lego, *I gather* or *choose;* lectus, *gathered*, as eleg*ant*, select.

Metior, *I measure;* mensus, *measured*, as mete, *im*mense

Patior, *I suffer;* passus, *having suffered*, as pati*ence*, *com*pass*ion*.

Pes, pedis, *the foot*, as pedes*trian*.

Phone, (Gr.) *a sound*, as *sym*phony.

Sedeo. *I sit;* sessus, *having sat*, as sed*entary*, sess*ion*.

Sisto, *I stop*, as re*sist*.

Stinguor, *I put out ;* stinctus, *put out*, as *distinguish*, *ex*tinct.

Sto, *I stand ;* stans, *standing;* statum, *to stand*, as *dis*tan*t*, stat*ionary*.

Tego, *I cover ;* tectus, *covered* as teg*ument*, *pro*tect.

Tendo, *I stretch ;* tensus, or tentus, *stretched*, as *dis*tend, *ex*tent.

Unus, *one*, as uni*form*.

Utor, *I use ;* usus, *having used* as uti*lity*, use*ful*.

Vado, *I go*, as *in*vade.

Vasto, *I lay waste*, as *de*vast*ation*.

Venio, *I come ;* ventus, *having come*, as *con*vene, *ad*vent.

Video, *I see ;* visus, *having seen*, as *pro*vide, vis*ible*.

Volo, *I will*, as vol*untary*.

Voro, *I devour*, as *carni*vorous

## LESSON IV.

Curro, *I run ;* cursus, *having run*, as *in*cur, *re*cur.

Jus, juris, *right*, *law*, as jus*tice*, *in*jury.

Medius, *the middle*, as *inter*med*iate*.

Modus, *a measure*, as mod*erate*.

Pando, *I spread ;* passus or pansus, *spread*, as *ex*pand, *com*pass.

Primus, *first*, as prim*itive*, prin*ciple*.

Rego, *I rule ;* rectus, *ruled*, *straight*, as reg*al*, *di*rect, rect*ify*.

Sentio, *I feel*, *I think ;* sensus, *felt*, as *dis*sent, sensi*ble*

Specio, *I see ;* spectus, *seen*, as spec*ious*, *in*spector.

Struo, *I build;* structus, *built* as struct*ure*, *de*stro*y*.

Turba, *a crowd*, as turb*ulent*.

Vita, *life*, as vit*al*.

## LESSON V.

Clino, *I bend*, as *re*cline.

Cor, cordis, *the heart*, as *con*cord.

Exter, *outward*, as exter*nal*.

Genus, generis, *a kind*, as gener*al*.

Mirus, *wonderful*, as *ad*mire.

Orno, *I deck*, as orn*ament*.

Pressus, *pressed*, as *sup*press.

Servo, *I keep*, as *pre*serv*er*.

Statuo, *I set up*, *I appoint*, (stituo when compounded,) as statu*e*, *con*stitu*te*.

Vario, *I change*, as vari*able*.

Vestis, *a garment*, as *di*vest.

Vulgus, *the common people*, as vulg*ar*, *di*vulge.

## LESSON VI.

Ango, anxi, *I vex*, as angu*ish*, anxi*ety*.

Cædo, *I cut;* cæsus, *cut*, (cido and cisus when compounded,) as *sui*cide, *in*cis*ion*.

Certus, *certain*, as cert*ify*.

Claudo, *I shut;* clausus, *shut* (cludo and clusus when compounded) as claus*e*, *ex*clud*e*, *con*clus*ion*.

Erro, *I wander* as *ab*erra*tion*.

Fluo, *I flow;* fluxus, *having flowed*, as flu*id*, *in*flux.

Gero, *I carry*; gestus, *carried*, as *vice*gerent, *sug*gest.
Hæreo, *I stick*; hæsus, *stuck*, as *ad*here, co*hesion*.
Minor, minus, *less*, *di*min*ish*.
Opus, operis, *a work*, as coope*rate*.
Pendeo, *I hang*, as *de*pend, *sus*pen*se*.
Pleo, *I fill*; pletus, *filled*, as *com*ple*te*.
Plico, *I fold*, as *im*plica*te*.
Pretium, *a price*, as *ap*preci*ate*.
Privo, *I take away*, as *de*priv*e*.
Sagus, sagax, *wise*, as sage, sa*gacity*.
Scio, *I know*, as *pre*science.
Seco, *I cut*; sectus, *cut*, as *dis*sect.
Sero, *I knit* or *join*, as *in*sert.
Similis, *like*, as simil*itude*.
Solvo, *I loose*; solutus, *loosed*, as *dis*solv*e*, solut*ion*.
Teneo, *I hold*; tensus, *held*, as ten*ant*, *con*tain, *de*ten*tion*.
Traho, *I draw*; tractus, *drawn*, as *at*tract.
Veho, *I carry*, as vehi*cle*, *con*vey.

## LESSON VII.

Acuo, *I sharpen*, as acu*te*.
Bene, *well*, as bene*volent*.
Cito, *I call*, *I rouse*, as *ex*cite.
Fugio, *I fly*, as fugi*tive*.
Gradior, *I go*; gradus, a *step*; gressus, *having gone*, as *retro*grade, grad*ual*, *pro*gress
Ligo, *I bind*, as lig*ament*.
Linquo, *I leave*; lictus, *left*, as *re*linqu*ish*, *re*lict.
Migro, *I remove*, as *e*migr*ate*
Solus, *alone*, as sol*itude*.
Spargo, *I spread*; sparsus, *spread* (spergo and spersus, when compounded,) as *dis*perse.

Valeo, *I am strong*, as *pre*vail.
Vinco, *I conquer*, as *in*vincible.

## LESSON VIII.

Ager, *a field*, as *pere*gr*ination*.
Ars, artis, *art* as arti*ficial*.
Atmos, (Gr.) *vapour*, as atmos*phere*.
Colo, *I cultivate*; cultus, *cultivated*, as colo*ny*, *agri*cult*ure*.
Doceo, *I teach*; doctus, *taught*, as doc*ile*, doct*rine*.
Fido, *I trust*, as *con*fide.
Fumus, *smoke*, as fum*igate*.
Fundo, *I pour out*; fusus, *poured out*, as *re*fund, *in*fuse.
Haustus, *drawn*, as *ex*haust.
Homo, *a man*, as hom*icide*.
Hospes, hospitis, *a guest*, as hospit*able*.
Infra, *below*, as infer*nal*.
Intra, intus, *within*, as inter*nal*.
Luxus, *luxury*, *excess*, as luxury, luxur*iant*.
Mel, *honey*, as mel*lifluous*,
Merx, *merchandize*, as *commer*c*ial*.
Noceo, *I hurt*; nocuus, *hurtful*, as *in*nocent, nox*ious*.
Nomen, *a name*, as *de*nomin*ate*.
Nutrio, *I nourish*, as nutri*men*,
Odé, (Gr.) *song*, as *melo*dy.
Pasco, *I feed*; passus, *fed*, as pas*tor*.
Peto, *I seek*, peti*tion*.
Porto, *I carry*, as *ex*port,
Præda, *plunder*, as preda*tory*.
Putris, *rotten*, as putre*fy*.
Repo, serpo, *I creep*, as rep*tile*, serp*ent*.
Ruptus, *broken*, as *e*rupt*ion*.
Tribuo, *I give*, as *con*tribute.
Via, *a way*, as *de*vi*ate*.
Voco, *I call*; vox, *the voice*, as *con*voke, voc*al*.

## LESSON IX.

Bibo, *I drink*, as *im*bibe.
Celo, *I hide*, as *con*ceal.
Clam, *secretly*, as clan*destine*.
Clemens, *merciful*, as cle*mency*.
Corpus, corporis, *the body*, as corpus*cle*, corpor*eal*.
Faber, *a workman*, as fab*ric*.
Malleus, *a hammer*, as mall*et*, malle*able*.
Maturus, *ripe*, as *pre*mature.
Misceo, *I mingle*; mixtus, *mingled*, as *promiscuous*, mix*ture*.
Moveo, *I move*; motus, *moved*, as *re*move, *com*mot*ion*.
Pactum, *a bargain*, as *com*pact.
Paro, *I make ready*, as *preparation*, re*pair*.
Pendo, *I weigh*; *I pay*; pensus, *having thought*, as pens*ive*, *ex*pendi*ture*.
Quatuor, *four*, as quar*ter*, qua*druped*.
Rarus, *thin*, as rar*efy*.
Signum, *a mark*, *de*sig*nate*.
Stringo, *I hold fast*; strictus, *held fast*, as *a*string*ent*, re*strict*.
Texo, *I weave*; textus, *woven*, as text*ure*, *con*text.
Unguo, *I anoint*; unctus, *anointed*, as ungu*ent*, unct*ion*.
Vapor, *steam*, as *e*vapor*ate*.
Votus, *having vowed*, as vot*ary* *de*vote.

## LESSON X.

Arbor, *a tree*, as arbor*aceous*.
Clamo, *I cry out*, as *pro*claim.
Clivus, *a slope*, as *de*cliv*ity*.
Corium, *skin*, as *ex*cori*ate*.
Densus, *thick*, as *con*dense.
Deus, *a god*, as dei*fy*.
Esca, *food*, as esc*ulent*.
Folium, *a leaf*, as foli*age*.
Ge, (G) *the earth*, as *geography*.
Graphe, *a description*; grapho, (Gr.) *I write*, as graph*ic*.
Hilaris, *cheerful*, as *ex*hilar*ate*.
Judex, judicis, *judge*, as judic*ial*.
Lignum, *wood*, as ligne*ous*.
Liqueo, *I melt*, as lique*faction*.
Plenus, *full*, as *re*plen*ish*
Spondeo, *I promise*: sponsus, *promised*, as *re*spond, spons*or*.
Uber, *plentiful*, as *ex*uber*ant*.
Umbra, *a shade*, as umbr*ageous*.
Vegeo, *to be strong*, *I grow*, as veget*able*.
Vigor, *strength*, as *in*vigor*ate*.

## LESSON XI.

Arma, *arms*, as *dis*arm.
Aroma, (Gr.) *odor*, as aroma*tic*.
Cado, *I fall*; casus, *fallen*, (cido when compounded,) as cad*ence*, casu*al*, *ac*cid*ent*.
Calculus, *a small pebble*, as calcul*ate*.
Eo, *I go*; itum, *to go*, as *circuit* *trans*it*ion*.
Flecto, *I bend*; flexus, *bent*, as *re*flect, flex*ible*.
Fluctus, *a wave*, as fluctu*ate*.
Gelu, *frost*, as gel*id*, *con*geal.
Gratia, *favor*; gratus, *agreeable*, as *in*grati*ate*, grati*fy*.
Herba, *an herb*, as herb*ivorous*.
Litera, *a letter*, as *il*liter*ate*.
Mare, *the sea*, as mar*ine*.
Medeor, medico, *I heal*, as *re*med*y*, medi*cine*.
Monstro, *I show*, *de*monstrate.
Nervus, *a sinew*, as *e*nerv*ate*.
Odor, *smell*, as odor*iferous*.
Oleo, *I smell*, as ol*factory*.
Pondus, *weight*, as ponder*ous*.
Proles, *offspring*, as prol*ific*.
Satis, *enough*, as satis*fy*.
Stupeo, *I am benumbed*, *amazed*, as stup*id*, stup*endous*.

Sumo, *I take;* sumptus, *taken*, as *as*sume, *pre*sumpt*ion*.

Trudo, *I thrust;* trusus, *thrust*, as *ob*trude, *in*trus*ion*.

Vagor, *I wander*, as vag*rant*, vag*abond*.

## LESSON XII.

Alter, *one of two*, as alter*nate*.

Annus, *a year*, as annu*al*, *per*enn*ial*.

Arceo, *I drive away*, *co*erc*ion*.

Celsus, *high*, as *ex*cel.

Civis, *a citizen*, as civ*ilize*.

Debeo, *I owe*, as deb*it*, debt*or*.

Deliciæ, *delight*, as delic*acy*, delic*ate*.

Dexter, *right handed*, as dexter*ity*.

Do, *I give;* datus, *given*, (ditus when compounded,) as dat*ive*, *ad*dit*ion*.

Fibra, *a thread*, as fibr*ous*.

Globus, *a ball*, as globu*lar*.

Gluten, *glue*, as glut*inous*.

Longus, *long*, as *e*long*ate*.

Mucus, *the filth of the nose*, as muc*ous*, muc*ilaginous*.

Navis, *a ship*, as navi*gate*.

Prehendo, *I take;* prehensus, *taken*, as *ap*prehend, *com*prehens*ion*.

Probo, *I prove*, as prob*ation*.

Sorbeo, *I such in*, *ab*sorb*ent*.

Uro, *I burn;* ustus, *burnt*, as *com*bust*ion*.

Velox, *swift*, as veloc*ity*.

## LESSON XIII.

Acidus, *sour*, as acid*ity*.

Aqua, *water*, as aqua*tic*, aque*duct*.

Arché, (Gr.) *government;* archon, *a ruler*, as *an*archy.

Aro, *I plough*, as ar*able*.

Calx, *lime*, as calc*areous*.

Centum, *a hundred*, cent*ury*.

Cresco, *I grow*, as cresc*ent*, *in*crease.

Culina, *a kitchen*, as culin*ary*.

Filum, *a thread*, as fila*ment*.

Fortis, *strong*, as forti*fy*.

Frango, *I break;* fractus, *broken*, as frag*ment*, fract*ure*, *in*fringe.

Granum, *a grain of corn*, as gran*ary*, granu*late*.

Jaceo, *I lie*, as *circum*jac*ent*.

Labor, *I silde;* lapsus, *having slided*, as *re*lapse.

Lapis, *a stone*, as lapid*ary*.

Lumen, *light*, as lumin*ous*.

Lustro, *I purify*, *I shine*, as lustr*ation*, *il*lustr*ious*.

Magnus, *great*, as magn*ify*.

Odos, (Gr.) *a way; Exodus*, *meth*od.

Optomal, (Gr.) *I see*, as opt*ics*.

Oxys, (Gr.) *acid*, as ox*ide*.

Pars, *a part*, as par*ticle*.

Penetro, *I pierce*, as *im*penetra*ble*.

Pulvis, *dust*, as pulv*erize*.

Pungo, *I sting;* punctam, *a point*, as pung*ent*, punctu*ation*.

Pyr, (Gr.) *fire*, as pyr*amid*, *em*pyr*en*.

Qualis, *of what quality, such as*, as quali*fy*.

Quatio, *I shake;* quassus, *shaken*, (cutio and cussus when compounded), as quas*h*, *con*cuss*ion*.

Rapio, *I carry off;* raptus, *carried off*, as rap*ine*, rap*ture*.

Sal, *salt*, as sal*ine*.

Sculpo, *I carve;* sculptus, *carved*, as sculpt*or*.

Sors, sortis, *a lot*, as *as*sort.

Tecton, *an artificer;* techne, (Gr.) *art*, as *archi*tect, techn*ical*.

Terminus, *a bound* or *limit*, as term, termin*ate*.

Torreo, *I parch;* tossus, *parched*, as torr*id*ast, to.

Tuber, *swelling*, as tuber*cular*.

Vallum, *a trench*, as *inter*val.

Vas, vasis, *a vessel*, as vase.

Vitrum, *glass*, as vitr*eous*.

## LESSON XIV.

Alo, *I nourish*, as ali*ment*.

Capillus, *a hair*, as capill*ary*.

Celer, *swift*, as *ac*celer*ate*.

C(k)ylindo, (Gr.) *I roll*, as cylind*er*.

Electron, *amber*, as electr*ify*.

Esse *to be*; ens, *being*, as essen*tial*, *non*ent*ity*.

Fatum, *fate*, *death*, as fat*al*.

Faux, *the throat*, as *suf*foc*ate*.

Flamma, *flame*, as flam*beau*, *in*flamma*tion*.

Fodio, *I dig*; fossus, *dug*, as foss*il*.

Halo, *I breathe*, as *in*hale.

Junctus, *joined*, as *con*junc*tion*.

Lædo, *I hurt*; læsus, *hurt*, (lido and lisus when compounded), as *col*lis*ion*.

Machina, *an invention*, *a trick* as machin*e*, machina*tion*.

Petros, (Gr.) *a stone*, as petr*ify*.

Plaudo, *I praise*, *I clap*, as *ap*plaud, *ex*plode.

Polis, (Gr.) *a city*, as poli*tical*.

Publico, *I make known*, as pub*lish*, publica*tion*.

Quantum, *how much*, quant*ity*.

Res, *a thing*, *state*, as r*epublic*.

Resina, *rosin*, as resin*ous*.

Sapio, *I taste*, *I am wise;* as *in*sipid, sapi*ent*.

Semi ; demi, (Fr.) hemi, (Gr.) *half*, as semi*circle*, demi*god*, hemi*sphere*.

Spatium, *space*, as spaci*ous*.

Stillo, *I drop*, as *di*stil.

Ventus, *the wind*, as venti*late*.

## LESSON XV.

Angulus, *a corner*, as angul*ar*.

Arsen, (Gr.) *male*, *strong*, as arsen*ic*.

Basis, (Gr.) *the foot*, base*ment*.

Baros, (Gr.) *weight*, baro*meter*.

Carbo, *coal*, as carbo*nic*.

Centrum, *the centre*, as centri*petal*, centri*fugal*.

Crux, crucis, *a cross*, as cruci*fy*, cruci*ble*.

Dendron, (Gr.) *a tree*, as dendr*itic*.

Geno, (Gr.) *I produce*, as *oxy*gen.

Ignis, *fire*, as ign*eous*.

Latus, *carried*, *broad*, as *di*late. lat*itude*.

Mathema, *knowledge*, mathemata, (Gr.) *the sciences*, as mathemat*ics*.

Metron (Gr.) *measure*, as *dia*meter.

Necto, *I tie*; nexus, *tied*, as *con*nect, *an*nex.

Poto, *I drink*; potio, *a draught*, as pot*ation*, pot*ion*.

Purus, *pure*, as pur*ify*, pur*itan*.

Rodo, *I gnaw*; rosos, *gnawed*, as *cor*rode, *cor*ros*ion*.

Scala, *ladder*, as scale.

Scopeo, (Gr.) *I see*, as *tele*scope, *epi*scop*acy*.

Sono, *I sound*, as sonor*ous*.

Tango, *I touch*; tactus, *touched*, as tan*gible*, *con*tact, ting*e*.

Tele, (Gr.) *distant*. tele*graph*.

Thermos, (Gr.) *hot*, as thermo*meter*.

Virus, *poison*, as viru*lent*.

Agon, (Gr.) *a contest*, as *anta*gon*ist*.

Angelos, (Gr.) *a messenger*, as angel, evangel*ist*.

Animus. *the mind*, *un*animous.

Aperio, *I open;* apertus, *opened*, as aperi*ent*, apert*ure*.

Arctos, (Gr.) *a bear*, *the north*, as arct*ic*, *ant*arct*ic*.

Ardeo, *I burn*, as ard*ent*.

Avidus, avarus, *greedy*, as avid*ity*, avar*icious*.

Botanè, (Gr.) *a plant*, as botan*y*, botan*ize*.

Candeo, *I am white*, *I burn*, as cand*id*, *in*cend*iary*.

Caput, *the head*, as capit*al*, *pre*cipit*ate*.

Cautus, *wary*, as *pre*cau*tion*.

Copia, *plenty*, as copi*ous*.

Decus, decoris, *grace*, *ornament*, as decor*ous*, decor*ation*.

Disco, *I learn*, as disc*iple*.

Domo, *I subdue;* dominus, *a master*, as domin*ant*, domain.

Ergon, (Gr.) *a work*, as *en*erg*y*, *metallurgy*.

Ether, *the sky*, as ether*ial*.

Experior, *I try;* expertus, *tried*, as experi*ment*, expert.

Fatigo, *I tire*, as *inde*fatig*able*.

Fermentum, *leaven*, as ferment*ation*.

Ferox, *cruel*, as fero*cious*.

Fors, fortis, *chance*, as fort*uitous*, *mis*fort*une*.

Gusto, *I taste*, as *dis*gust.

Harmonia, (Gr.) *joining together*, as harmon*y*.

Lex, legis, *a law*, as leg*al*, legis*lator*.

Liber, *free*, as liber*ty*, *il*liber*al*.

Limes, *a boundary*, limi*tation*.

Locus, *a place*, as loc*omotion*, *dis*loc*ate*.

Ludo, *I play;* lusus, *a play*, as lud*icrous*, *de*lus*ion*,

Lyra, (Gr.) *a lyre* or *harp*. lyric.

Macies, *leanness*, as emaci*ate*.

Mando, *I chew*, as mand*ible*.

Monos, (Gr.) *alone*. mon*archy*.

Myrios, (Gr.) *numberless*, myriad.

Norma, *a rule*, as enorm*ous*.

Nosco, cognosco, *I know;* cognitus, *known*, as recogn*ize*, recognit*ion*.

Notus, *known*, as not*able*, no*torious*.

Numerus, *a number*, as *in*numer*able*,

Nuncio, *I tell*, as *an*nounce.

Ordo, *order*, *law*, as *extra*ordi*nary*, ord*ain*.

Palatum, *the roof of the mouth*, *taste*, as palat*able*.

Par, *equal*, as par*ity*, pair, *separate*.

Pario, *I beget*, *I bring forth*, as par*ent*, parr*icide*.

Phainomai, (Gr.) *I appear*, as phenom*enon*.

Pluma, *a feather*, as plum*age*.

Poleo, (Gr.) *I sell*, *monopoly*.

Polys, (Gr.) *many*, as poly*syllable*.

Pous, podos, (Gr.) *a foot*, as *poly*pus, *anti*podes.

Practos, (Gr.) *done*, as *im*pract*icable*.

Privus, *one's own*, *peculiar*, as priv*ate*, priv*ilege*..

Prodigium, *a wonder*, as prodig*y*, prodigi*ous*.

Promo, *I bring forth*, *I tell;* promptus, *ready*, as prompt*er*, prompt*itude*.

Prope, *near;* proximus, *nearest* as prop*inquity*, *ap*proxim*ate*.

Rado, *I scrape;* rasus, *scraped*, as *e*rase.

Sacer, *sacred*, as sacr*ifice*, *con*secr*ate*.

Salio, *I leap;* saltus, *leapt*, (silio and sultus when compounded), as sali*ent*, *as*sault, *re*sil*ient*, *in*sult.

Salus, salutis, *health*; salvus, *safe*, as salut*ary*, salv*ation*.

Sequor, *I follow*; secutus, *followed*, as *sub*sequ*ent*, *ex*ecute.

Socius, *a companion*, as soci*al*, *as*soci*ate*.

Speculor, *I look for*, specul*ate*.

Spiro, *I breathe*, as *ex*pire.

Splendeo, *I shine*, as splend*id*.

Sponte, *of one's own will*, as spont*aneous*.

Stratus, *thrown down*; stratum, *a bed*, as *pro*strate, strat*ify*.

Terreo, *I frighten*, as terr*ible*.

Tolero, *I bear*, as *in*toler*ant*.

Torpeo, *I am benumbed*, torp*id*.

Totus, *the whole*, as tot*al*.

Toxicon, (Gr.) *poison*, as *in*toxi*cate*.

Tremo, *I tremble*, trem*endous*.

Tropos, (Gr.) *a turn*, as trope, trop*ical*.

Unda, *a wave*, as und*ulate*.

Vacuus, *empty*, as evacu*ate*.

Velo, *I cover*, veil, *revelation*.

Venenum. *poison*, venom*ous*.

Venor, *I hunt*, as ven*ison*.

Vestigium, *a trace* or *mark*, as vest*ige*, *in*vest*igate*.

Vetus, veteris, *old*, as veter*an*.

Vinum, *wine*, vin*ous*, vin*tage*.

Viscus, *glue*, as visc*id*.

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## SECTION II.

Ædes, *a house*, as edi*fy*.

Ævum, *an age*, as *co*ev*al*.

Agger, *a heap*, as *ex*agger*ate*.

Arbiter, *an umpire. a ruler*, as arbitr*ation*, arbitr*ary*.

Artus, *a joint*, as artic*ulate*.

Asper, *rough*, as asper*ity*, *ex*asper*ate*.

Ballo, *I throw*; bolé, (Gr.) *a throw*; ball. Bal*earic*, *sym*bol.

Ceres, *the goddess of corn*; cere*al*.

Cholé, (Gr.) *bile, anger*, as *melan*choly, choler*ic*.

Cumulus, *a heap*, *ac*cumul*ate*.

Curvus, *crooked*, as curv*ature*.

Daimon, (Gr.) *a spirit*, as demon*iac*, *pan*demon*ium*.

Debilis, *weak*, as debil*itate*.

Deleo, *I blot out, I destroy*, as *in*del*ible*, delet*erious*.

Demos, (Gr.) *the people*, as dem*agogue*. *epi*dem*ic*.

Despotes, (Gr.) *a master*, as despot*ic*.

Dignus, *worthy*, as dign*ify*.

Dynamis, (Gr.) *power*, as dynam*ics*, dyna*sty*.

Equus, *a horse*, as equ*ipage*.

Eu, (Gr.) *well*, as eu*phony*.

Fanum, *a temple*. *pro*fan*ation*.

Fateor, *I own*; fassus, *having owned*; (fiteor, and fessus when compounded) as *con*fess, *pro*fess.

Fertilis, *fruitful*, as fertil*ize*.

Filius, *a son*; filia, *a daughter*, as fili*al*.

Fissum, *cleft*, as fiss*ure*.

Frigeo, *I am cold*, as frig*id*.

Fulgeo, *I shine*, as *re*fulg*ent*.

Gigas, *a giant*, as gigan*tic*.

Glacies, *ice*, glaci*er*, glaci*al*.

Gnomi, *I know*; gnostos, *known*, as *physio*gnomy, *pro*gnost*ic*.

Grandis, *great* grandi*loquent*.

Hæres, hæredis, *an heir*, as heredi*tary*.

Helios, (Gr.) *the sun*, as *ap*hel*ion*, Helio*polis*.

Hieros, (Gr.) *holy*. hier*archy*.

Humidus, *moist*, as humid*ity*.

Humus, *the ground*, as *post*hum*ous*, hum*idity*.

Hygros, (Gr.) *moist*, hygr*ometer*

Impetus. *force*, as impetu*ous*.

Insula, *an island*, as insul*ar*.

Jugum, *a yoke*, as *sub*jug*ate*.

Legumen, *pulse*, leguminous

Lethe, (Gr.) *forgetfulness*, aleth*argy*.
Linea, *a line*, as *de*line*ate*, *recti*line*ar*.
Lithos, (Gr.) *a stone*, as litho*graphy*.
Logos, (Gr.) *a word*, as *dia*logue, *analogy*.
Luna, *the moon*, as *sub*lun*ary*.
Major, *greater*, as major*ity*.
Mando, *I bid*, as mand*ate*, *com*mand.
Maneo, *I stay*, as *per*man*ent*, *re*main.
Melan, *black*, as melan*choly*.
Melior, *better*, as *a*melior*ate*.
Memor, *mindful*, memor*ial*, memor*andum*.
Miles, militis, *a soldier*, milit*ary*.
Mineo, *I hang*, as *pro*min*ent*.
Minister, *a servant*, as ministr*ation*.
Mors, mortis, *death*, *im*mort*al*.
Mos, moris, *a manner*, mor*al*.
Murus, a *wall*, as *im*mure.
Musa, *a muse*, *song*, as mus*ic*, *a*muse.
Muto, *I change*, as mut*able*.
Nesos, *an Island*, as *Pelopon*nesus, *Poly*nes*ia*.
Novus, *new*, as *in*nov*ate*.
Nox, noctis, *night*, noct*urnal*.
Obscurus, *dark*, obscur*ation*.
Omnis, *all*, as omni*fic*.
Origo, *the beginning*, as *ab*origi*nal*.
Os, oris, *the mouth*, as or*al*, or*ifice*.
Ovum, *an egg*, ov*al*, ov*iparous*.
Pater, *a father*, as patern*ai*.
Pathos, (Gr.) *feeling*, as *sym*path*y*, *a*path*y*.
Pelagus, *the sea*, *Archi*pelago.
Pene, *almost*, as pen*insula*.
Physis, (Gr.) *nature*, as physi*ology*.
Pingo, *I paint*; pictus, *painted*, as pict*ure*, *de*pict.
Pius, *godly*, as pi*ety*, *impious*.
Ploro, *I wail*, as *de*plore.
Populus, *the people*, popul*ar*.
Potens, *powerful*, as poten*tate*, *armi*potent.
Presbys, *old*; presbyteros. (Gr.) *older*, as presbyter*ian*.
Puto, *I prune*, *I think*, as *am*put*ate*, *dis*pute.
Pylé, (Gr.) *a gate*, *Thermo*pylæ.
Radius, *a ray*, as *ir*radi*ate*,
Ramus, *a branch*, as ram*ify*.
Rigo, *I water*, as *ir*rig*ate*.
Rudis, *rude*, *ignorant*, as rudi*ment*, *e*rud*ite*.
Sanguis, *blood*, as sangui*nary*.
Senex, *old*, as sen*ile*, sen*ator*.
Sepultus, *buried*, as sepult*ure*, sepul*chre*.
Silex, *a flint*, as sil*icious*.
Sinus, *a bosom*, *a bay*, as *in*sinu*ate*, sinu*osity*.
Sol, *the sun*, as sol*ar*, sol*stice*.
Sterilis, *barren*, steril*ity*.
Strophe, (Gr.) *a turning*, as *apo*strophe, *cata*strophe.
Surgo, *I rise*; surrectus, *risen*, as *in*surg*ent*, *re*surrec*tion*.
Timeo, *I fear*, as tim*orous*, timid*ity*.
Tonos, (Gr.) *tension*, as *sound*, *semi*tone.
Trepidus, *fearful*, as trepid*ation*, *in*trepid.
Tres, *three*, as tri*pod*, tri*angle*.
Tricæ, *a hinderance*, *ex*tric*ate*.
Typos, (Gr.) *a pattern*, or *figure*, as typ*ical*, *anti*type.
Vanus, *empty*, *vain*, as van*ish*, van*ity*.
Verbum, *a word*, as verb*al*, verb*ose*.
Vulcanus, *the god of smiths*, as volcano.

## SECTION III.

Ago, (Gr.) *I lead*, as *dem*agogue, *syn*agogue.

Alienus, *belonging to another*, as alien*ate*.
Audio, *I hear*, as audit*or*, audi*ence*.
Augeo, *I increase;* auctus, *increased*, as aug*ment*, auc*tion*, au*thor*.
Colossus, *a huge statue*, as co*lossal*.
Credo, *I trust, I believe*, as cre*dit*, *in*cred*ible*.
Crimen, *a crime*, as crimin*al*.
Discrimen, *a difference*, as discrimin*ate*.
Divinus, *heavenly, foretelling*, as divin*ity*, divin*ation*.
Emo, *I buy;* emptus, *bought*, as *re*deem, *ex*empt*ion*.
Fecundus, *fruitful*, fecund*ity*.
Firmus, *strong*, as *con*firm.
Fœdus, fœderis, *a treaty*, as *con*feder*ate*.
Frons, *the forehead*, as front*ier*, *con*front.
Grex, gregis, *a flock*, as *con*greg*ate*.
Idem, *the same*, as iden*tify*.
Ira, *anger*, as ira*scible*.
Jubilo, *I shout for joy*, jubil*ee*.
Laxus, *loose*, as *r*elax.
Levis, *light*, lev*ity*, *al*levi*ate*.
Mater, (meter, Gr.) *a mother*, as mater*nal*, metr*opolis*.
Mergo, *I plunge;* mersus, *plunged*, emerge; *im*mers*ion*.
Narro, *I tell*, as narr*ation*.
Patria, *one's country*, as patrio*tism*.
Phemi, (Gr.) *I speak*, as *blas*phemy, *pro*phet, *em*pha*sis*.
Punio, *I punish;* pœna, *punishment*, as, *im*punity, pen*al*.
Pusa, *a little girl*, as pus*illanimous*.
Regula, *a rule*, as *ir*regul*ar*.
Sanctus, *holy*, as sanct*ify*.
Seculum, *an age, the world*, as secul*ar*.
Spero, *I hope*, as *de*sper*ate*, *de*spair.
Stigo, *I push on*, as *in*stig*ate*.
Temno, *I despise;* temptus, *despised*, *con*temn, *con*tempt*ible*.
Tempus, temporis, *time*, as tempor*al*, *co*tempor*ary*.
Tetras, (Gr.) *four*, as tetr*arch*.
Urbs, *a city*, urb*ane*, *sub*urbs.

## SECTION IV.

Bellum, *war*, as bell*igerent*.
Charis, (Gr.) *love, thanks*, as char*ity*. *Eu*charis*t*.
Cheir, (Gr.) *the hand*, as chi*rurgeon*, whence surgeon.
Egeo, *I need*, *indigent*, *ex*ig*ence*.
Hortor, *I advise*, *ex*hort*ation*.
Legatus, *appointed, bequeathed*, as *de*legate, leg*acy*.
Miser, *wretched*, as miser*able*.
Nomos, (Gr.) *a law*, *astr*onom*y*.
Oikos, (Gr.) *a house*, eco*nomy*.
Proprius, *one's own*, as proper*ty*, *ap*propri*ate*.
Stereos, (Gr.) *solid*, *firm*, as stereo*type*.

## SECTION V.

Amplus, *large*, as ampl*ify*.
Astron, (Gr.) *a star*, astro*logy*.
Atrox, *cruel*, as atro*city*.
Censeo, *I think*, *I judge*, as cen*sure*, censo*rious*.
Cilium, *the eye-lid*, as *super*cili*ous*.
Chronos, (Gr.) *time*, as chro*nometer*.
Cras, *to-morrow*, *pro*cras*tinate*.
Dens, dentis, *a tooth*, as dentis*t*, *in*dent.
Dotos, (Gr.) *given*, as *anti*dote.
Dulcis, *sweet*, dulc*et*, dulc*ify*.

Ethnos, (Gr.) *a nation*, as eth*narch*, *h*eathen.
Fari, *to speak*, as *preface*.
Gravis, *heavy*, as gravi*ty*.
Horreo, *I dread*, as horr*ible*.
Loqui, *to speak*, as *soli*loquy.
Malé, *wickedly*, as male*volent*.
Micros, *small*, as micro*scope*.
Nihil, *nothing*, as *an*nihil*ate*.
Palla, *a cloak*, as pall*iate*.
Pulmo, *the lungs*, pulmo*nary*.
Rus, ruris, *the country*, as rus*tic*, rur*al*.
Stella, *a star*, as *con*stella*tion*.
Taphos, (Gr.) *a tomb*, *epi*taph.
Vello, *I pull;* vulsus, *pulled*, as *con*vuls*ion*.

*FINIS.*

Kil

w days